ENGINEERS & CONSULTANTS

Paul C. Rizzo Associates, Inc.
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October 1, 2009
Project No. 09-4157

Mr. Dennis Miller
Lockheed Martin
2890 Woodbridge Ave #209
Edison, NJ 08837

TRANSMITTAL
ASSESSMENT OF DAM SAFETY OF
COAL COMBUSTION SURFACE IMPOUNDMENTS
DRAFT INSPECTION REPORT
SITE 30 (BRUCE MANSFIELD)

Dear Mr. Miller:

Transmitted herewith are two copies of the referenced Draft inspection Report for management units located at Site 30.

If you have any questions or require any additional information, please contact me at (412) 856-9700, ext. 1008, or john.osterle@rizzoassoc.com.

Respectfully submitted,
Paul C. Rizzo Associates, Inc.

John P. Osterle, P.E.
Vice President
Dam & Water Resource Projects

JPO/lck/kef

cc: Stephen Hoffman – USEPA

3140-FM-WE0001 Rev. 3/2008

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING
DIVISION OF DAM SAFETY

DEP Data Records	Inspection Record # 1763619
Complaint Record #	Enforcement Record #

DAM SAFETY INSPECTION NOTICE

DEP Office	SWRO- PITTSBURGH Phone 4122442000	Dam Permit or ID. #	D04-049
Address	400 WATERFRONT DR PGH PA 15222	Dam or Project Name	LITTLE BLUE RUN
		County	BEAVER
Owner or Permittee	FIRST ENERGY GENERATION CORPORATION	Municipality	GREENE TOWNSHIP
Complete Mailing Address	BRUCE MANSFIELD PLANT PO Box 128 SHIPPINGPORT PA 15077-0128	*Take GPS readings at the center of the crest of the dam.* Latitude:	40 ° 37 ' 40.14" N
		Longitude:	80 ° 30 ' 47.79" W

Type of Inspection:
- ☐ ADMIN - Administrative / File Review
- ☐ CEI - Compliance Evaluation
- ☐ COMPL - Complaint Inspection
- ☐ CONST - Construction Progress
- ☒ DAM12 - Category 1 or 2 dam
- ☐ DAM3 - Category 3 dam
- ☐ FUI - Follow-up Inspection
- ☐ INCDT - Incident response
- ☐ OTHER _____

Fold Line *Fold Line*

Location / Appurtenance	Insp.	Condition OK	Condition Concern	Comment / Explain Concern	Violation? Check if yes	Cite 25 Pa. Code
Crest	☒	☒	☐		☐	
Upstream Face	☒	☒	☐		☐	
Downstream Face	☒	☒	☐		☐	
Outlet Structure	☐	☐	☐		☐	
Outlet Conduit	☐	☐	☐		☐	
Primary Spillway	☒	☒	☐		☐	
Emergency Spillway	☒	☒	☐		☐	
Spillway Channels	☒	☒	☐		☐	
Downstream Toe Area	☒	☒	☐		☐	
Encroachments	☐	☐	☐		☐	
Site Restoration	☐	☐	☐		☐	
E & S Plan on Site	☐	☐	☐		☐	
E & S Controls	☐	☐	☐		☐	
	☐	☐	☐		☐	
	☐	☐	☐		☐	
	☐	☐	☐		☐	

RECEIVED
2009 FEB 10 PM 2:33
DAM SAFETY

Inspection Results Code:
- ☐ DVN (De Minimus Violation)
- ☒ NOVIO (No significant violations noted)
- ☐ OUTST (Outstanding violations, notice req'd)
- ☐ RECUR (Recurring violations)
- ☐ REPAR (Repairs or upgrade required)
- ☐ VIOIC (Viols noted and immediately corrected)
- ☐ VIOLS (Violation(s) noted)
- ☐ VOV (New and outstanding violations Noted)
- ☐ VRV (New and recurring violations noted)

Violations Noted? ☐ Yes ☐ No **Field Notice of Violation?** ☐ Yes ☐ No **Compliance Order?** ☐ Yes ☐ No

Remarks: *This report is a summary of the undersigned DEP representative's visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The inspector's full report is available by contacting the DEP office noted above.*

SEEPAGE AND LANDSLIDING ON DOWNSTREAM ABUTMENT SHOULD BE MONITORED. NUMBER OF PIEZOMETERS SHOULD BE EVALUATED. EVALUATE LEAKAGE INTO MILL CREEK VALLEY. SEEPAGE SETTLEMENT SHOULD BE MONITORED

DEP Inspector was accompanied by		DEP Rep:	Date:
☐ Owner	☐ Engineer for Owner or Permittee	(signature) D. Karl Hintze	2/26/09
☐ Permittee	☐ Other:	(print name) DENNIS HINTZE Phone 412-442-4271	Time:

☐ White – Owner, Permittee, or Representative ☐ Yellow – Division of Dam Safety, Central Office ☐ Pink – DEP Regional File

DAM INSPECTION REPORT

Dam No.: D04-049
Dam Name: Little Blue Run
Inspected By: D. K. Hartner
Date of Inspection: 01/21/2009
Accompanied By: Joe Schlutz and First Energy Staff
Inspection ID: 1763619

LOCATION

Stream: Little Blue Run
Municipality: Greene Township
County: Beaver

USGS TOPO: East Liverpool North **North:** 0.51inches **West:** 1.84 inches

Latitude: 40° 37′ 40.14″ **Longitude:** 80° 30′ 47.79″ **GPS Verified** Yes (WAAS 2009)
The datum for Latitude and Longitude is NAD 1983.
Elevations in this report are given in feet above mean sea level (MSL) or NAVD 1929.

Directions: Take Route 30 West to Hookstown and Route 168. Turn right onto Route 168 and proceed into Hookstown. At the stop sign turn left onto Georgetown Road and drive about 2 miles to an old railroad grade and a gated road on the left. Usually you can meet the Company representative here and they will take you around the site.

OWNER:

First Energy Generation Corporation
76 South Main Street
Akron, OH 44308
330-384-5151

SITE:

Brian Warnake
Director of Business and Technical Services
Bruce Mansfield Plant
P.O. Box 128
Shippingport, PA 15077-0128
724-643-2300

PERTINENT DATA:

Type: Earth and Rock with impervious core
Height: 400 feet
Storage: 73,000 acre-feet
D.A.: 2.93 square miles
Class: A1 High Hazard

Submitted by: D. Karl Hartner
The observations presented herein are the results of a brief visual inspection only, and represent the visual condition of the dam only on the date inspected. The condition of a dam can change rapidly, particularly with changes in reservoir level and climatic conditions. This is to certify that the above dam has been briefly visually observed and this report documents the results of this brief visual visit.

D. Karl Hartner D Karl Hartner 02/05/09

PRESENT CONDITIONS

Crest: This is a curved dam with the vertex pointed upstream. The crest is 2100 feet long by 50 feet wide at elevation 1,100 with a maximum elevation of 1,102 at the center of the dam. It is topped with a crushed stone access road.

Upstream Face: The upstream face is a uniform 2 to 1 slope with a rock exterior. The rock appears in good condition.

Downstream Face: The downstream slope is 1 to 1 slope with a large rock cover. There are various springs along the right abutment at elevation 930 which are now collected and discharge into a weir on the right. The left abutment seepage discharges to a weir on the left. There have been several landslides on the left abutment and this should be monitored closely. Seeps at the toe are piped parallel to the face of the dam and discharge into the right weir.

Secondary Spillway (Approach, crest, outlet, abutments, etc.): The secondary spillway is a 36 diameter concrete pipe through the right abutment. There is a trash rack and treatment system at the entrance to this pipe. There is a valve at this inlet and the discharge elevation can be varied between 1087.5 and 1090. The pipe discharges to the gabion lined ditch which runs down the right abutment to the stilling basin at the toe.

Service Spillway and Wasteway: The service spillway is located on the left side of the dam. The inlet has an invert at elevation 1090.3. There is a rock lined trapezoidal channel that leads to the new inlet. This spillway discharges to a 48-inch concrete pipe 1000 feet long that discharges to the stilling basin.

Emergency Spillway (Approach, crest, outlet, abutments, etc.): The emergency spillway is located along the left side of the dam (to the left of the secondary spillway). It is labyrinth spillway in a trapezoidal earth channel with a bottom width of 30 feet and 2 to 1 slopes. The invert is elevation 1095. The channel discharges over the hillside into a wooded area.

Drawdown Facilities: There are no drawdown facilities at this dam.

Downstream Toe and Area Beyond (Seepage, toe drain, vegetation, etc.): The toe consists of a 6 foot thick filter blanket with a perforated PVC drain pipe. There is a stilling pond at the toe that collects all of the seeps and the outlet for the secondary spillway.

Action(s) on Previous Recommendations: N/A

Comments: This dam is in good condition. The seeps on both abutments are monitored on a regular basis. Landsliding on the left downstream abutment has been a historic problem and observations should be made on a regular basis. There seems to be a very small number of working piezometers within this dam. The value of piezometric readings within the various zones should be evaluated and additional piezometers installed as necessary. LiDAR elevations indicate that the saddle dam crest is below 1100. This should be checked at periodic intervals. The valley below the saddle dam has been impacted by leachate and there is a pump return system for this water. The leakage in this valley and in the Mill Creek valley in general should be evaluated. Settlement of the geotubes that are retaining waste in the upper parts of the valleys should be monitored quantitatively.

Submitted by: D. K. Hartner
Permitting and Technical Services
Watershed Management
Southwest Regional Office

cc: Division of Dam Safety

File No.: D04-049

Dam Name: Little Blue Run

Directions: Take Route 30 West to Hookstown and Route 168. Turn right onto Route 168 and proceed into Hookstown. At the stop sign turn left onto Georgetown Road and drive about 2 miles to an old railroad grade and a gated road on the left. Usually you can meet the Company representative here and they will take you around the site.

OWNER:
First Energy Generation Corporation
76 South Main Street
Akron, OH 44308
330-384-5151

SITE:
Brian Warnake
Director of Business and Technical Services
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P.O. Box 128
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****

Inspections:

06/09/93 Dam inspection report by G. C. Johnson

09/02/93 Ltr from Greene Twp. Board of Supervisors - concern for safety of pond. Dept. responded - all factors considered , all readings appear within acceptable limits.

11/09/93 Memo to Martin from G. C. Johnston - Reservoir is leaking into Mill Creek Valley-Penn Power hired consultant, CEC, Inc. has to advise on seepage matter. Mr. Hartner will notify office if any significant developments occur.

09/12/94 Inspected by Harrisburg, Tom Belot. There are still some ATV tracks on emergency spillway, otherwise same appeared good condition.

8/23/95 Ltr to owner concerning bi-annual inspection report. (report not enclosed).

12/21/95 Rec. new EAP

9/26/96 Inspected by D. Kolojejchick, PE. No significant deficiencies were observed.

5/22/98 Received copy of annual inspection report.

7/30/98 Inspected by Kriley. Visually the dam appears in good condition. Owner continues to monitor seeps.

8/26/99 Inspected by Kriley. Visually the dam appears in good condition. Owner continues to monitor seeps.

8/3/00 Inspected by Kriley. Visually the dam appears in good condition. Owner continues to monitor seeps. Work has begun to collect the discharge from some of the seeps and pump water from the dam to a new pipe located below the downstream basin to the river. They are also planning to put a drainage system in the river groin to collect the seeps. Finally work will e done on the crest to address the sag.

11/9/00 Inspected by Kriley with Joe Smith and Stanley R. Michalski. The bypass pipe from stilling basin to the river has been completed. The contractor was finishing mulching the site. Some of the rip rap and fill needs to be pulled back on the upper end near the stilling basin. The new base flow discard from the basin at the lower left abutment weir is currently entering perpendicular to the channel. This needs to be realigned. The gabion lined channel to the stilling basin on the right abutment side has been constructed. The contractor was placing additional ties and rocks where needed. Two areas were identified where small ditches are discharging to the side of the gabions. These discharges will be piped to the gabion channel to avoid scouring along the new gabion channel. The pipe from the hillside seeps has not been placed yet. The rip rap channel above the gabion channel has been constructed. Because of the location of the fly ash pipe lines the channel was not excavated to the full depth per the plans. On the right side of the channel they have built a berm. Note: This berm also prevents water from the adjacent roadway from getting into the channel and presents both a stability problem for the channel and a possible scour problem on the roadway side of the channel. They have also installed the 24" pipe from the rip rap channel to the proposed new treatment plant located on the downstream end of the new bore holes. They have bored two holes for the new secondary spillway. Both of the bores came out too low. Water is entering the bore holes and exiting at the downstream end. Per the owner, based on water samples the water is not from the lake. The owner is planning on filling the holes with concrete. He is to forward his plan to Rodger for his approval before any work is done.

5/24/01 Inspected by C. Kriley and Joe Smith. Additional rock has been added to the energy dissipator below the outfall to the river. Approximately 6,000 gpm is currently being pumped from the lake. Vegetation has come in, in the areas that were previously mulch and seed. A new 90 elbow has been attached to the end of the new base flow discharge from the lower left abutment weir. Material has been pulled back from the channel located below basin. A 30" plastic pipe has been placed from the right abutment weir to the stilling basin. The pressure from the water has created various leaks. To temporarily address this they have constructed a rock lined channel to pick up the leaks. It also appears that the current flow is too much for the existing right abutment weir. It is beginning to scour above the weir on the right side, and the water is flowing over the V notch in the weir. The gabion lined and rock lined channel has been completed. There are areas where water is scouring along the gabions. The water is mostly from the hillside but some appears to be coming from the water flowing through the gabions. The water in the gabions also appears to overtop or flow through

in some of the step areas. Additional gabions may be needed. The roadway has been elevated in the areas where the rock lined channel (right side) has been bermed with the rock. Now the channel is at grade. The current 6,000 gpm left very little freeboard in the channel. They have installed cross pipes to pick up the water from the road to divert it to the new channel. The two new 24" culverts for the road to RAP 1 and 2 has been constructed. There is also a bend beginning to form in the rock lined channel that needs to be addressed. They have temporarily connected a bypass to the 22" pipe so that they can pump the lake down. They have two 3,000 gpm pumps that pump the water to a treatment area which then discharges through a 22" Drisco pipe that is buried from the treatment area to the proposed collection area (secondary spillway outlet box) at the downstream face where the new bore hole is located. Here it is connected to the 28" pipe which discharges to the riprap channel. they have placed the 29" pipe through the bore hole. There is no water coming through the pipe yet. There is a small seep coming around the concrete located around the pipe (2-3 gpm). The old bore holes have been filled with concrete. They are doing the form work for the new secondary spillway inlet.

They have begun work on the trench drain. It currently picks up RAP 1 and 2. They have also placed the particle flume on the downstream end. I also looked at the existing primary and emergency spillway. There was some woody vegetation that needs to be removed from both. Currently the lake is at elevation 1087'. The following were the final weir readings:

Lower left abutment weir	0.35
Stilling basin weir	1.20
Upper left weir	0.80
Toe drain weir SW #3	0.35
Lower right weir	2.6
Upper right flume	1.8

We still need to address the stream erosion problem created by the decreased flow. The channel is eroding below the railroad tunnel. There is also sediment from the tunnel that continues to wash out.

6/21/01 Inspected by C. Kriley and Stanley R. Michalski, GAI Consultants, Inc. No water was being pumped. The pool has been lowered to elevation 1087. Per my discussion with Stanley, additional material will be pulled back along the right bank side from the channel located below the basin to where the lower left abutment weir discharges. The
30" plastic pipe which was leaking at various locations during the last inspection was no longer leaking since they have stopped pumping. Per Stanley this pipe is planned to be removed and replaced with a rip rap channel similar to the Type 3 that is shown on the approved plans. Stanley is also proposing to riprap the existing open channel located between the lower right weir and the existing 30" culvert. I told Stanley that he needs to get approval from Dam Safety before

doing this work. We also looked at the lower right weir which is beginning to scour on the right side. Stanley said this was created because the rip rap channel from the end of the gabions to the basin was not constructed per the plans. The current rip rap channel has a 90° bend in it. The plans show a slight bend in the channel. Stanley is going to elevate what should be done. To address the problems with water scouring along the gabions, gravel has been placed along the gabions to pick up the water. They have also constructed some ditches to divert water to the gabion channel. Some of these ditches need to be lined yet. I also had a question on whether the fabric along the gabions should be removed where these ditches tie in. I also discussed with Stanley my concerns that water is coming out of the gabion channel at some of the steps. It appears that additional gabions are needed at some of the steps. Kevin from GAI was measuring the size of the rip rap channel above the gabion channel to determine it if was large enough. I told him and Stanley the information would have to be submitted to Dam Safety for their approval. The bend in the rip rap channel still needs addressed. Along the left side of the rip rap channel needs additional rock or fill in some areas. There is a lump of concrete at the outlet of the 24" Drisco pipe that discharges to the rip rap channel. The concrete is just sitting on top of the rip rap. I told Stanley that it appeared that the concrete pile should be removed. If they need to grout the rip rap they could but the grout needs to be in and around the rip rap, not on top of it. The temporary bypass has been removed. They have finished grouting around the new Drisco pipe that was bored through the dam. No seepage was observed from around the pipe. A small discharge was coming through the pipe. They have finished the now secondary spillway inlet. This made a change to the 6 x 8 open weir that was designed. They have now enclosed this area and constructed a 3' wide stop log structure with an invert elevation 1083. The plan on placing a trash rack influent of the opening. I told them this change needs to be approved also.

Note: The Drisco Pipe from the new secondary outlet to the rip rap channel is 24". Not the 28" on the last report. Also, the pipe through the dam is 22".

No further work has been done on the bench drain. The contractor is worried about slope stability. They are looking into stabilizing the work pad with rock as they go from RAP 1 & 2 to RAP 12.

The following were the weir readings:

Lower left abutment weir		0.35
Stilling basin weir	0.30	
Upper left weir	0.80	
Toe drain weir SW #3		0.35
Lower right weir	0.65	
Upper right flume	Not read	

There are still various areas that need to be vegetated. We also looked at the erosion problem in the channel located below the railroad tunnel. Stanley is going to remove the weir from the V-notch to the right side (where the old steel plate was) and then place some rip rap on the right side to deflect the water to the existing channel.

They were also doing exploratory digging at the crest as part of the upcoming crest work.

8/16/01 Inspected by C. Kriley and Joe Smith (from Bruce Mansfield Plant), John and Mike from Beaver County Conservation District. Still no water was being pumped. The pool was at elevation 1087.5. I talked to Joe about the removal of the material along the right bank below the basin where the lower left abutment weir discharges, he said they tried to but encountered large rock and they felt it was better to leave it alone. I agreed with Joe so no further work will be done here. The 30" plastic pipe which had been leaking has been removed and in its place is a grouted riprap channel. Also the channel that fed the culvert from the lower right weir has been reconstructed into a riprap lined channel. I asked Joe if they had gotten approval from Dam Safety to do this work since I had not been informed by anyone that it had been approved. Joe said he did not know. The lower right weir which had been scouring has been addressed. The riprap channel feeding it has been reconstructed in accordance with the plans. The dirt collection ditches along the gabion channel have all been rock lined. Some of them appear to have too much rock or were not excavated enough to place the rock. Two of them appear that the fabric may be still in place between the rock channel and the gabion channel. There were three piles of rock and debris on the lower three steps of the gabion channel. Joe said this would be addressed. Additional gabions were added at most of the steps where the water was going over the gabions. I was told that they (GAI) have finished their review of the riprap channel above the gabion channel and it can only pass the 10 year storm. This will need to be addressed. The lump of concrete at the outlet of the 24" Drisco pipe has been removed and the channel was sluice grouted. The secondary spillway outlet box is completed and the Drisco pipe has been installed. They have excavated a channel to the new secondary spillway. Approximately 30 feet of the channel starting at the new spillway has been rock lined. The last, approximately 70 feet was bare earth. The bottom

of the channel was about 4 feet wide and 2:1 side slopes and 8 feet deep. These are all estimates since the channel was full of water. I told Joe that they need to look at lining the rest of the channel since the banks have already begun to erode. They have placed the trash rack that was for the original designed secondary spillway on the new structure. There is also a gauge staff on the secondary spillway tower.

Work has been completed on the bench drain. They made changes to this also. Some of the drains feed into the designed bench drain while approximately half

are collected and discharge down the face of the dam in a plastic pipe which discharges into the riprap above the lower right abutment weir.

The weirs were not read.

Most of the site has been seeded and mulched and some areas are vegetated.

They have removed part of the weir from the V-notch to the right side and placed some of the broken concrete along the right abutment of the R/R culvert.

They are working on the as-builts. I will schedule one more inspection in September which should be the final inspection for this phase of work.

10/5/01 Inspected by Kriley. Water was flowing through the new secondary inlet. They were adjusting the valves to control the flow and they were adding acid (sulfuric acid) to adjust the pH levels. The water was overtopping the stilling basin weir structure. They have rock lined the rest of the inlet channel. The water was coming out of the channel just downstream or where the 24" Drisco pipe discharges to the riprap channel (just below the part they grouted). The water has caused the rock to wash out and build up in the channel. they are currently adding the acid through a gravity feed line to the now secondary spillway inlet. They have a temporary 5000 gallon tank there now. They have constructed the pad for the permanent 20,000 gallon tank. They have raised the crest of the dam approx. 4 at the center. They still have one more lift to be placed. Note they are using a steel tandem roller. They still need to place the rock on the upstream face. They were also working on seeding part of the impoundment area. This was on the left side of the dam to the left of the emergency spillway. This work is part of the future closure of the impoundment. The riser at the outlet structure was cut off. Kids were placing stones and wood behind the pad blocking the flow.

The pool elevation was 1088. The following weirs were read: Lower left abutment weir - 030 and Lower right weir - 2.62.

8/8/02 Letter to owner acknowledging receiving results. Construction work on supernatant bypass is complete.

3/24/02 Letter to Harrisburg. As-builts of secondary spillway.

5/12/03 Inspected by C. Kriley. The dam visually appears in good condition. The seeps are continuously monitored. The springs in the left abutment are difficult to view due to the vegetation. The lower left abutment weir needs cleaned out. Water is bypassing the weir. Some minor woody vegetation needs to be removed from the principle and emergency spillways.

09/03/04 Inspected by C. Kriley, L. Busack & Stacy Lash. The dam visually appears in good condition. The seeps are continuously monitored. The springs in the left abutment are difficult to view due to the vegetation. The lower left abutment weir needs cleaned out. Water is bypassing the weir. Some minor woody vegetation needs to be removed from the principle and emergency spillways.

08/29/05 Inspected by L. Busack. The modification of the right primary spillway was underway. The left abutment seepage continues to be a concern.

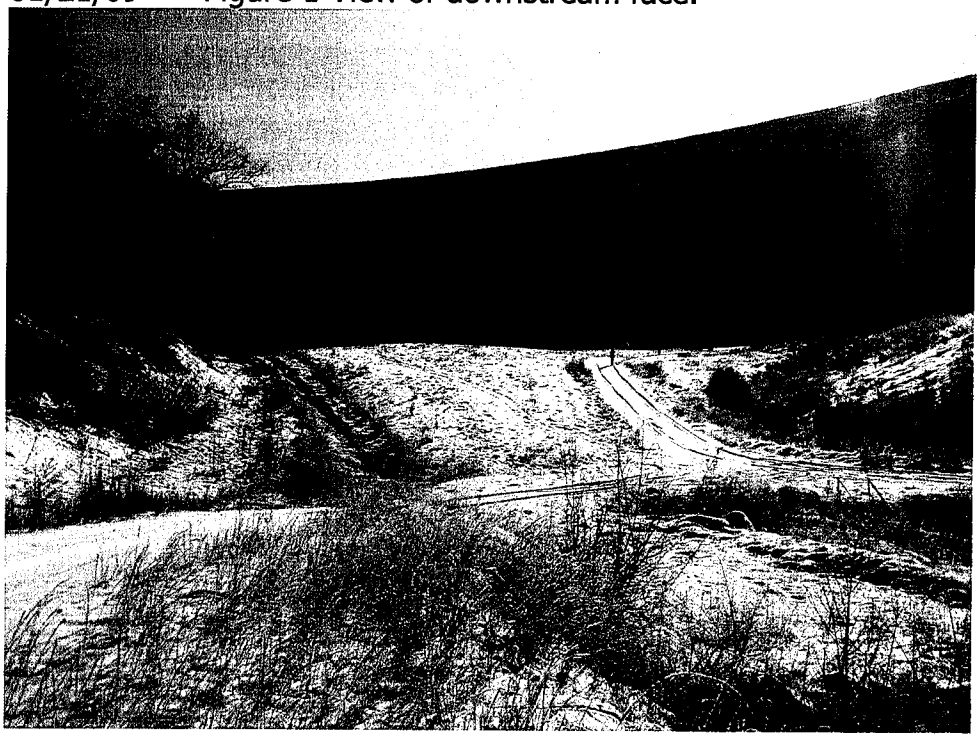
09/21/06 Inspected by L. Busack. The modification of the right primary spillway is complete. The left abutment seepage continues to be a concern. Expansion of the left emergency spillway will start soon.

10/23/07 Inspected by L. Busack. The modification of the emergency spillway is complete. The left abutment seepage continues to be a concern.

08/19/08 Inspected by L. Busack. The left abutment seepage continues to be a concern. The seepage from the right side has diminished.

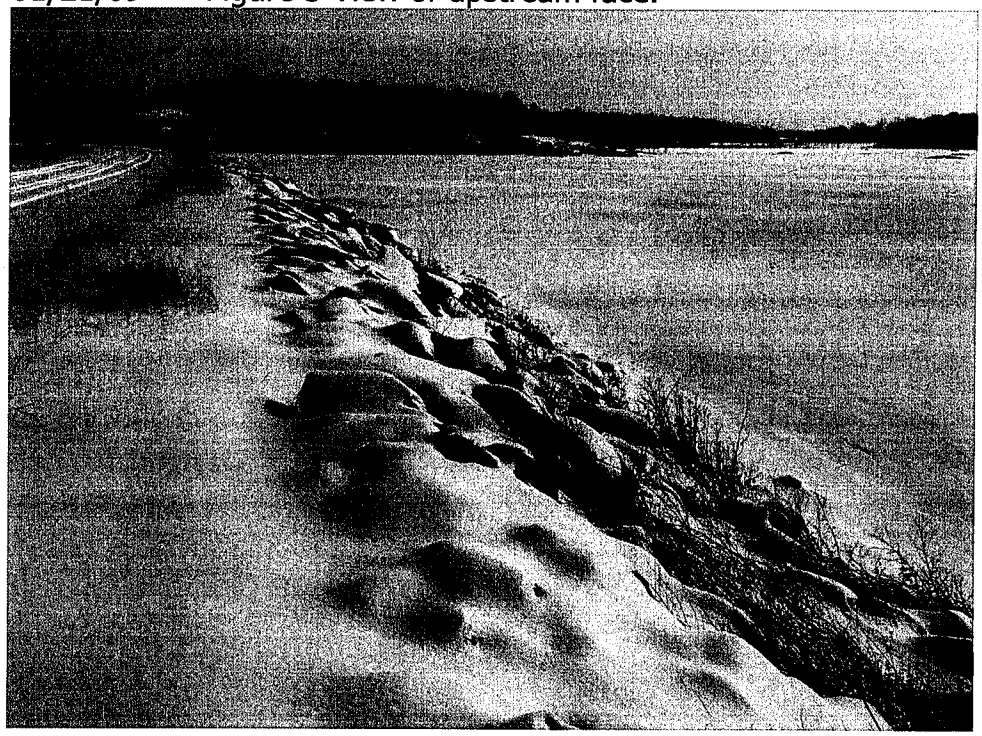
01/21/09 Inspected by D. K. Hartner. This dam is in good condition. The seeps on both abutments are monitored on a regular basis. Landsliding on the left downstream abutment has been a historic problem and observations should be made on a regular basis. There seems to be a very small number of working piezometers within this dam. The value of piezometric readings within the various zones should be evaluated and additional piezometers installed as necessary. LiDAR elevations indicate that the saddle dam crest is below 1100. This should be checked at periodic intervals. The valley below the saddle dam has been impacted by leachate and there is a pump return system for this water. The leakage in this valley and in the Mill Creek valley in general should be evaluated. Settlement of the geotubes that are retaining waste in the upper parts of the valleys should be monitored quantitatively.

D04-049 01/21/09 Figure 1 View of downstream face.



D04-049 01/21/09 Figure 2 View of crest.

D04-049 01/21/09 Figure 3 View of upstream face.

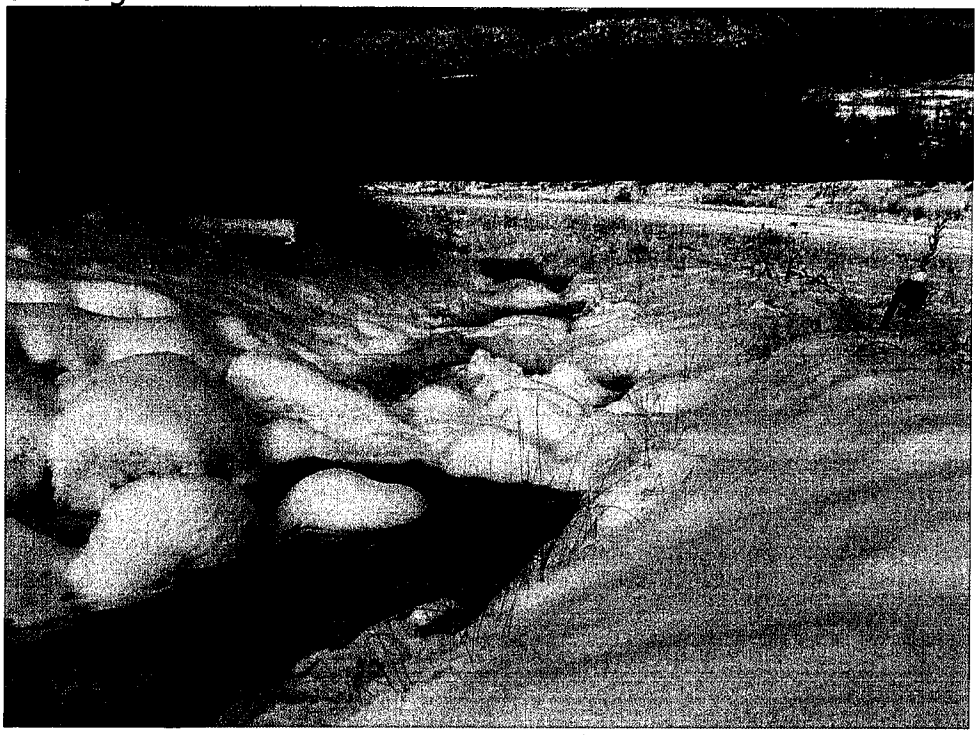


D04-049 01/21/09 Figure 4 View of primary spillway inlet and treatment system.

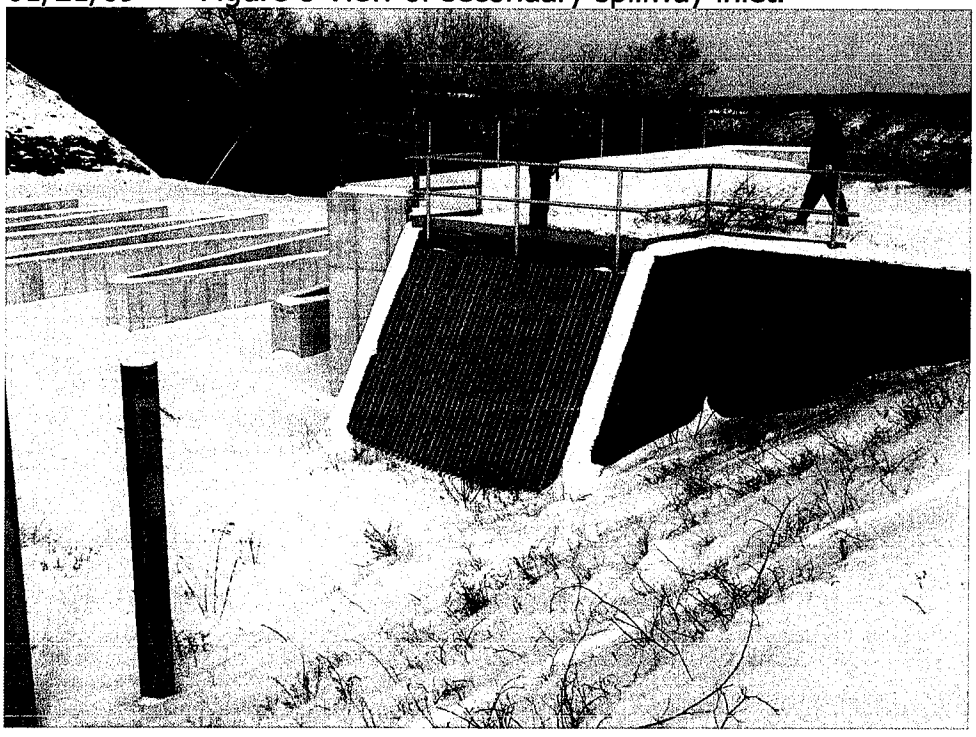
D04-049 01/21/09 Figure 5 View of pond inlet from impoundment.

D04-049 01/21/09 Figure 6 View of discharge of primary spillway pipe.

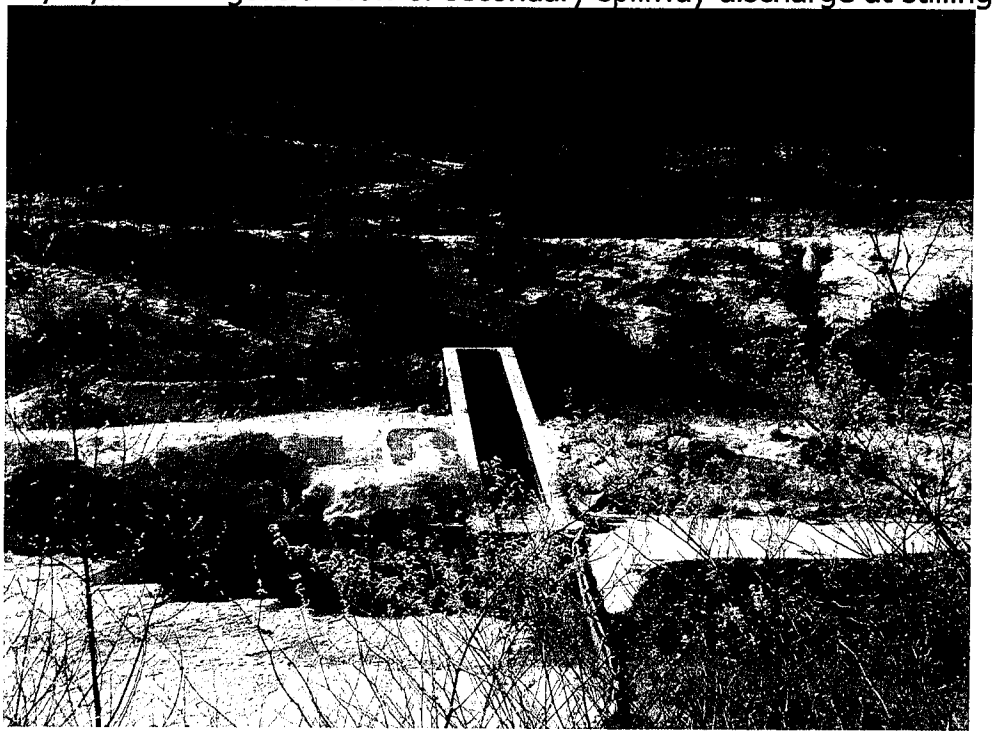
D04-049 01/21/09 Figure 7 View of gabion lined ditch below primary spillway discharge.



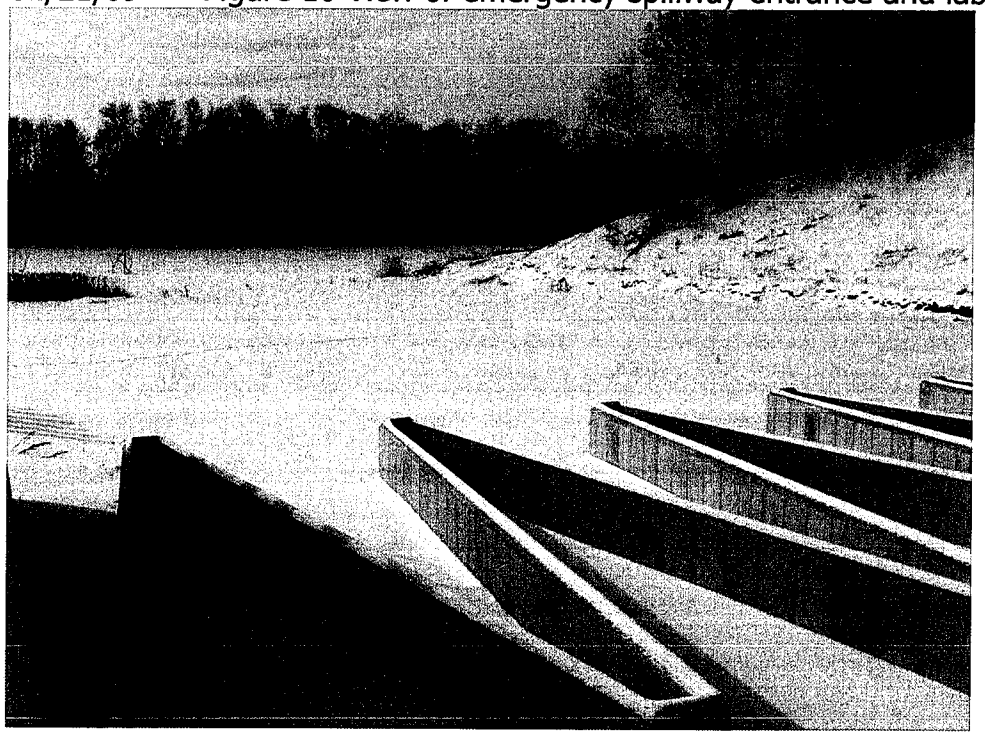
D04-049 01/21/09 Figure 8 View of secondary spillway inlet.



D04-049 01/21/09 Figure 9 View of secondary spillway discharge at stilling basin.

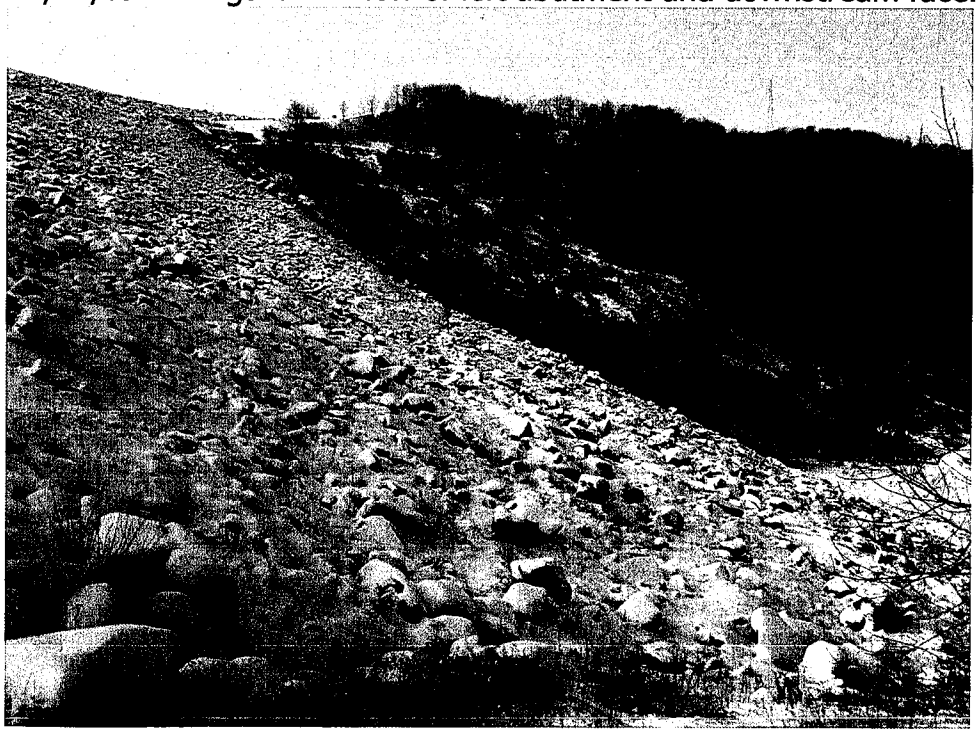


D04-049 01/21/09 Figure 10 View of emergency spillway entrance and labyrinth.

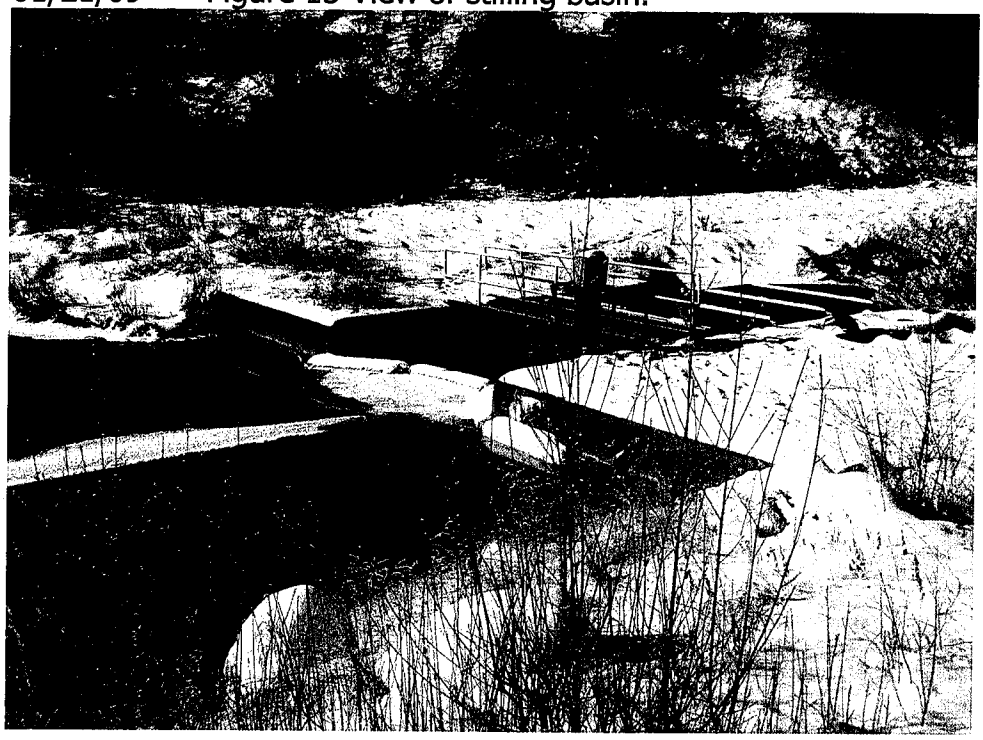


D04-049 01/21/09 Figure 11 View of discharge end of emergency spillway.

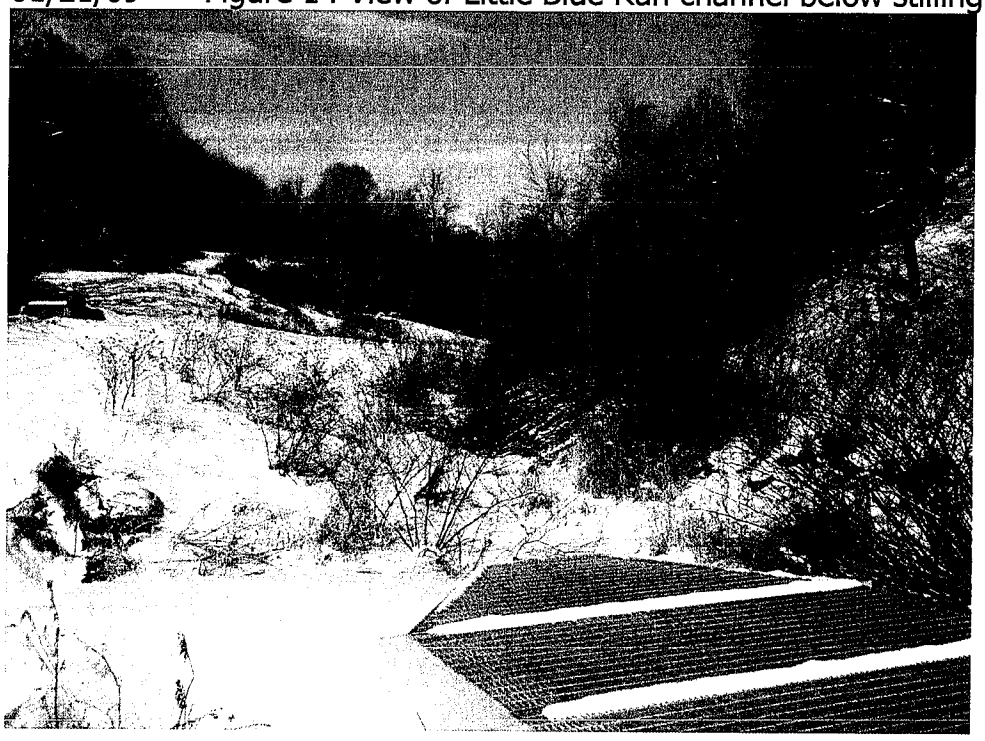
D04-049 01/21/09 Figure 12 View of left abutment and downstream face.



D04-049 01/21/09 Figure 13 View of stilling basin.

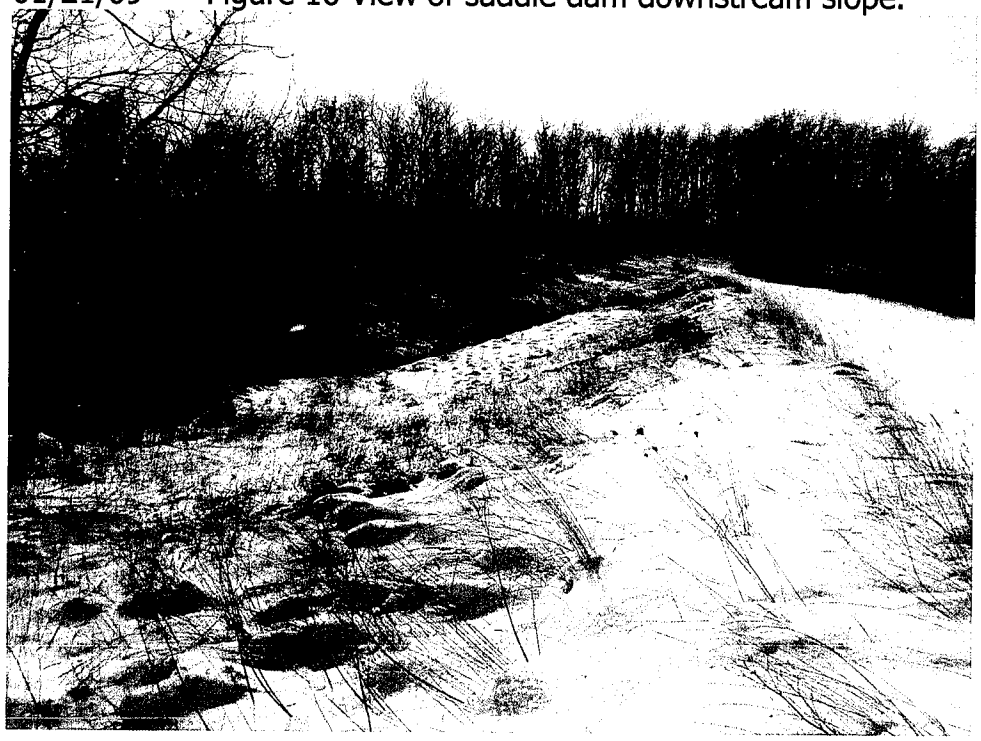


D04-049 01/21/09 Figure 14 View of Little Blue Run channel below stilling basin.



D04-049 01/21/09 Figure 15 View of discharge area near the Ohio River.

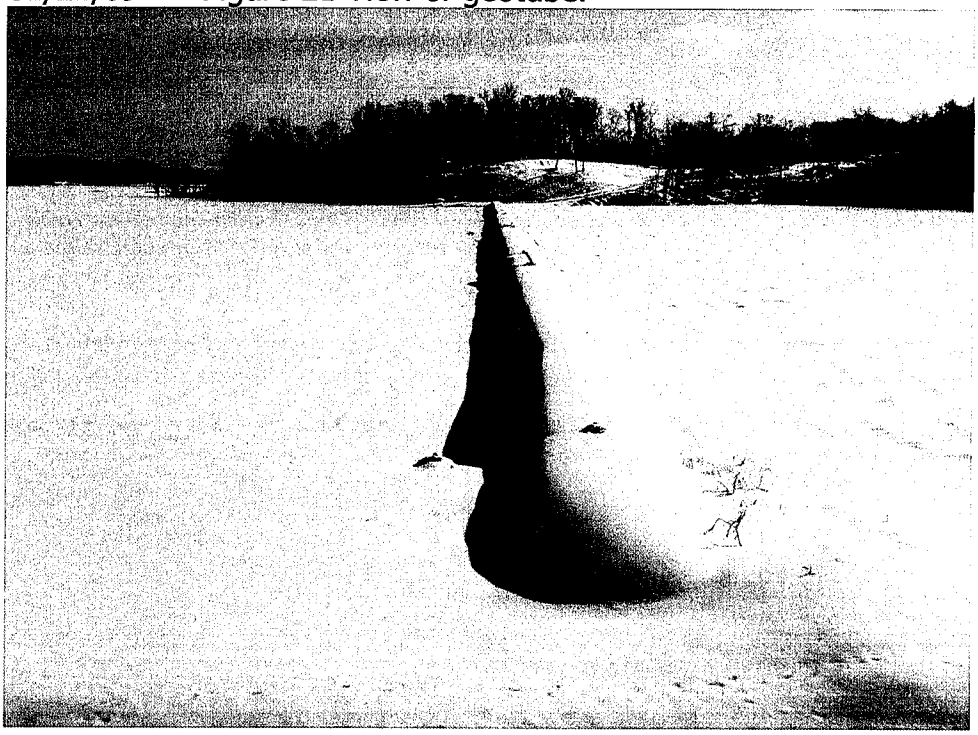
D04-049 01/21/09 Figure 16 View of saddle dam downstream slope.



D04-049 01/21/09 Figure 17 View of saddle dam crest.

D04-049 01/21/09 Figure 18 View of upstream slope of saddle dam.

D04-049 01/21/09 Figure 21 View of geotube.

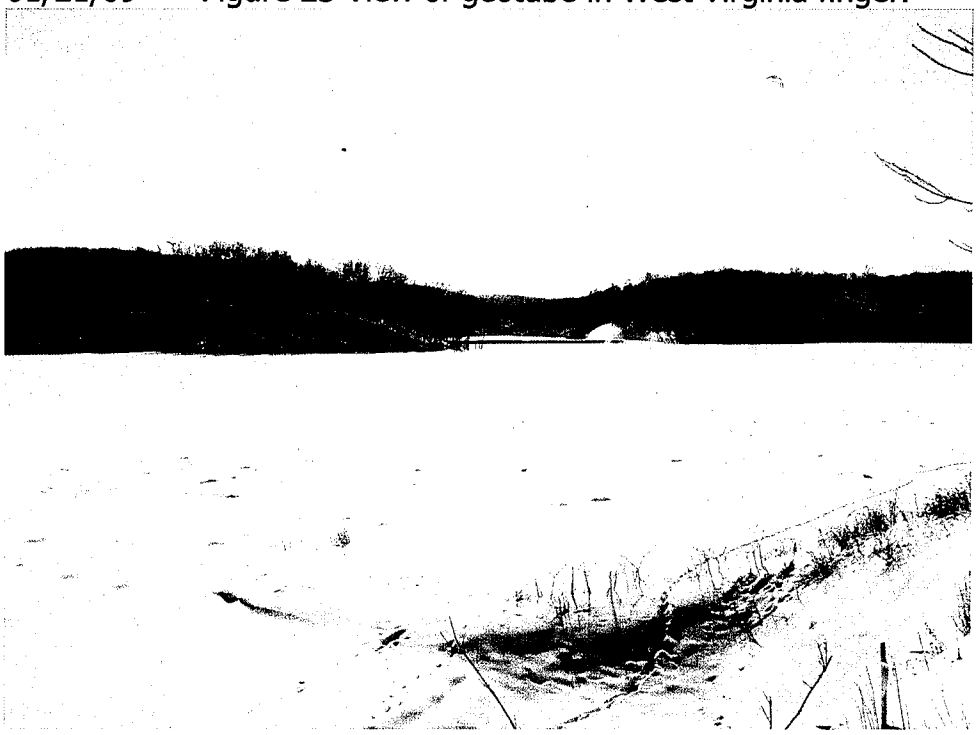


D04-049 01/21/09 Figure 22 View of geotube across West Virginia finger.

D04-049 01/21/09 Figure 19 View of seep on right abutment above collection system.

D04-049 01/21/09 Figure 20 View of long geotube starting in West Virginia and continuing to Pennsylvania

D04-049 01/21/09 Figure 23 View of geotube in West Virginia finger.



3140-FM-W E0001 Rev 3/2008

DEP DATA RECORDS	Inspection Record # **1738888**
Complaint Record #	Enforcement Record #

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING
DIVISION OF DAM SAFETY

DAM SAFETY INSPECTION NOTICE

DEP Office Address	Southwest Regional Office Phone 412-442-4315 400 Waterfront Drive Pittsburgh, PA 15222-4745	Dam Permit or I.D. # **d04-049** Dam or Project Name **Little Blue Run** County **Beaver**
Owner or Permittee	**Richard Sprecker, Environmental Supervisor** **First Energy Generation Corp**	Municipality **Greene Township** Stream **Little Blue Run**
Complete Mailing Address	**Bruce Mansfield Plant** **P.O. Box 128** **Shippingport, PA 15077-0128**	Take GPS readings at the center of the crest of the dam. Latitude: **40 ° 37 ' 39 " N** Longitude: **80 ° 30 ' 43 " W**

Type of Inspection:
ADMIN – Administrative/File Review
CEI – Compliance Evaluation
COMPL – Complaint inspection
CONST – Construction Progress
■DAM12 – Category 1 or 2 dam
DAM3 – Category 3 dam
FUI – Follow up
INCDT – Incident response
OTHER_____

Location/ Appurtenance	Insp.	Condition OK	Condition Concern	Comment/Explain Concern	Violation Check if yes	Cite 25 Pa. Code
Crest	■	■				
Upstream Face	■	■				
Downstream Face	■	■				
Outlet Structure						
Outlet Conduit						
Primary Spillway	■	■				
Emergency Spillway	■	■				
Spillway Channels	■	■				
Downstream Toe Area	■	■				
Encroachments						
Site Restoration						
E & S Plan on Site						
E & S Controls						
Emergency Action Plan						
Left Abutment	■		■	Seepage on left DS abutment		

Inspection Results Code:	DVN (De Minimus violations)	■NOVIO (No significant violations noted)	OUTST (Outstanding violations, notice req'd)	RECUR (Recurring violations)	REPAR (Repairs or upgrade required)
	VIOIC (Viols noted and immediately corrected	VIOLS (Violation(s) noted)	VOV (New and outstanding violations noted	VRV (New and recurring violations noted)	

Violations Noted? Yes No **Field Notice of Violation?** Yes No **Compliance Order?** Yes No

Remarks: This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. The inspector's full report is available by contacting the DEP office noted above.

The left abutment seepage continues to be a concern. The seepage from the right side has diminished.

DEP Inspector was accompanied by		**DEP Rep:**		Date:
■Owner	Engineer for Owner or Permittee	(signature)		**8/19/08**
Permittee	Other -	(print name) Lawrence Busack	Phone: 412-225-0747	Time:

White – Owner, Permittee, or Representative
Yellow – Division of Dam Safety, Central Office
Pink – DEP Regional File

■

Dam Number:d04-049 **Date**: 8/19/08

DAM INSPECTION REPORT

Dam No.: D04-049
Dam Name: Little Blue Run
Inspected By: Lawrence Busack, SWRO
Date of Inspection: 8/19/08
Accompanied By: Robert Kish, senior consultant

LOCATION

Stream: Little Blue Run
Municipality: Greene Township
County: Beaver

Latitude: **40 ° 37 ' 39 "** North
Longitude: **80 ° 30 ' 43 "** West

USGS TOPO: East Liverpool, North OH-PA-WV **North:** 1.2 inches **West:** 2.4 inches

Directions

Mile	Instruction	For	Toward
0.0	**Depart 13A on SR-60 [Beaver Valley Expy] (North)**	**0.2 mi**	
0.2	At exit 13B, take Ramp (RIGHT) onto SR-68 [State St]	7.0 mi	PA-68 / Midland
7.1	Take Ramp onto SR-168 [Shippingport Bridge]	0.8 mi	PA-168 / Shippingport
8.0	Turn RIGHT (South) onto SR-168	3.3 mi	
11.2	Keep STRAIGHT onto Pine St	0.2 mi	
11.4	Road name changes to Georgetown Rd	3.2 mi	
14.6	*Gate access required* Turn LEFT (West) onto Little Blue Hollow Rd	0.7 mi	
15.3	Turn LEFT (South) onto access road	0.5 mi	
15.8	**Arrive D04-049**		

OWNER: Frank Lubich
Site First Energy Generation Corp
Bruce Mansfield Plant
P.O. Box 128
Shippingport, PA 15077-0128
724-643-5000

Richard Sprecker, Environmental Supervisor
724-682-6852 office
spreckerr@firstenergycorp.com

Contact: Robert Kish, Senior Consultant
412-974-0749 (cell)
kishr@firstenergycorp.com

Alexander Daquila – emergency drill
724-682-6845 office
412-974-9575 cell
daquilaa@firstenergycorp.com

Engineer: Stanley R. Michalski, P.G
Phillip E. Glogowski, P.E.
GAI Consultants, Inc.
385 East Waterfront Drive

Dam Number:d04-049 **Date**: 8/19/08

Homestead, PA 15120-5005
412-476-2000 ext 1420 Stanley R. Michalski
s.michalski@gaiconsultants.com
412-476-2000 ext 1414 Philip Glogowski,
p.glogowski@gaiconsultants.com

PERTINENT DATA

Type: Rock fill with impervious soil care
Height: 400 feet
Storage: 73,000 acre-feet
D.A.: 2.9 sq. miles
Class: A-1

PRESENT CONDITIONS

Crest	This is a curvilinear dam with the vertex pointed upstream. The crest is 2100 feet long by 50 feet wide at elevation 1100 with a maximum elevation of 1102 at the center of the dam. It is topped with a crushed stone access road. There is an upstream saddle dam.
Upstream Face	The upstream face is a uniform 2 to 1 slope faced with large rock riprap. Normal pool elevation is1088. The water is about pH 11
Downstream Face	The downstream slope is a 2 to 1 slope faced with large rock riprap. In order to collect seepage from along the right abutment there is a perforated 6" perforated HDPE trench drain at elevation 1015 and an 8" perforated HDPE trench drain at elevation 930 that connect to a solid 8" HDPE collection pipe that goes down the right groin and discharges to a small channel just above the toe. There is also a 6" perforated HDPE trench drain at elevation 930 that discharges to a small collection weir on the right abutment adjacent to the road. On the left abutment, starting at about elevation 930, there is a large area of seepage approximately 400 feet long by 175' feet high that is covered with wetland vegetation and has several surficial slides in the shallow soil over the bedrock. The seepage probably comes from the impoundment at elevation 1088. The impounded water has a pH of approximately 11 and the right abutment seepage has a pH of about 8+
Outlet Structure	
Outlet Conduit	
Primary Spillway	The right primary spillway has an inlet with a trash rack controlled by a 3' wide stop log structure with the invert at 1083. There is a rock lined trapezoidal channel that leads to the new inlet. Between the inlet and the impoundment is a soil berm with two 24" plastic pipes 50 feet long to control the amount of ash getting into the spillway. Inside the inlet are valves to control the discharge.
Emergency Spillway	The labyrinth weir crest emergency spillway is located along the left side of the dam. The base is at elevation 1092 and the crest is at elevation 1095. The approach is a trapezoidal channel with shallow bedrock that opens to the impoundment. To the right is a 36" diameter concrete pipe inlet with the invert at 1088. This pipe spillway outlet drops in elevation 400' within a 36" concrete pipe before entering the stilling basin at the toe of the dam
Spillway Channels	The right primary spillway discharges into a 24" HDPE pipe that enters a DS box at elevation 1060 and then crosses the road at elevation 1000. It then follows

	along the road in an open channel leading to the stilling basin. From the stilling basin the discharge is piped through a 24" Drisco pipe (supernatant bypass pipe). The bypass pipe goes through the railroad tunnel and discharges to a headwall with an energy dissipater that then flows to Mill Creek. The emergency spillway wasteway channel discharges over the hillside into a wooded area then by overland flow to the stilling basin..
Downstream Toe Area	The toe consists of a 6 foot thick filter blanket with a perforated PVC pipe. There is a stilling pond at the toe that collects all of the seeps and the outlet for the primary spillway.
Left Abutment	The left abutment is at a 1.8 to 1 slope. There are wetlands high on the abutment and there were 2 surface slides, 1 in December 2001 and 1 in August 2004. The water within the impoundment is at a pH of 11 and the pH exiting the abutment is probably at a pH of 8+ since the pH of the water on the right side is at a pH of 8+.
Encroachments	
Site Restoration	
E & S Plan on Site	
E & S Controls	

Recent Correspondence and Action(s) on Previous Recommendations:

Comments: The left abutment seepage continues to be a concern. The seepage from the right side has diminished.

Submitted by: Lawrence Busack, SWRO

This report is solely developed to monitor this facility for compliance with the Dam Safety Program. It is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. Use of any information within this report requires the user to independently verify the observations, recommendations, and conclusions.

3140-FM-W E0001 6/2005

DEP DATA RECORDS	Inspection # **1663620**
Complaint #	Enforcement #
Dam # **D04-049**	Date **10/23/07**

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING
DIVISION OF DAM SAFETY

DAM SAFETY INSPECTION NOTICE

DEP Office Address	Southwest Regional Office Phone 412-442-4315 400 Waterfront Drive Pittsburgh, PA 15222-4745	Dam Permit or I.D. # **d04-049** Dam or Project Name **Little Blue Run** County **Beaver**
Owner or Permittee	**Richard Sprecker, Environmental Supervisor** **First Energy Generation Corp**	Municipality **Greene Township** Stream **Little Blue Run**
Complete Mailing Address	**Bruce Mansfield Plant** **P.O. Box 128** **Shippingport, PA 15077-0128**	Take GPS readings at the center of the crest of the dam. Latitude: **40 ° 37 ' 39 "** North Longitude: **80 ° 30 ' 43 "** West

Type of Inspection: ADMIN – Administrative/File Review; CEI – Compliance Evaluation; COMPL – Complaint inspection; CONST – Construction Progress; ■ DAM12 – Category 1 or 2 dam; DAM3 – Category 3 dam; FLWUP – Follow up; INCDT – Incident response; OTHER_____

Location/ Appurtenance	Insp.	Condition OK	Condition Concern	Comment/Explain Concern	Violation Check if yes	Cite 25 Pa. Code
Crest	■	■				
Upstream Face	■	■				
Downstream Face	■	■				
Outlet Structure						
Outlet Conduit						
Primary Spillway	■	■				
Emergency Spillway	■	■				
Spillway Channels	■	■				
Downstream Toe Area	■	■				
Encroachments						
Site Restoration						
E & S Plan on Site						
E & S Controls						
Left Abutment	■		■	Seepage on left DS abutment		

Inspection Results Code:				
	NOVIO (No significant violations noted)	OUTST (Outstanding violations, notice req'd)	RECUR (Recurring violations)	■ REPAR (Repairs or upgrade required)
	VIOIC (Viols noted and immediately corrected	VIOLS (Violation(s) noted)	VOV (New and outstanding violations noted	VRV (New and recurring violations noted)
	DVN (deminimus violations noted)			

Violations Noted? Yes No Field Notice of Violation? Yes No Compliance Order? Yes No

Remarks: This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. The inspector's full report is available by contacting the DEP office noted above.

The modification of the emergency spillway is complete. The left abutment seepage continues to be a concern.

DEP Inspector was accompanied by		DEP Rep:	Date:
■ Owner	Engineer for Owner or Permittee	(signature)	**10/23/07**
Permittee	Other	(print name) Lawrence Busack Phone: 412-225-0747	Time:

White – Owner, Permittee, or Representative Yellow – Division of Dam Safety, Central Office Pink – DEP Regional File

■

RECEIVED
2007 NOV 30 AM 10:13
DIV. OF DAM SAFETY

Dam Number: d04-049 **Date**: 10/23/07

DAM INSPECTION REPORT

Dam No.: D04-049
Dam Name: Little Blue Run
Inspected By: Lawrence Busack, SWRO
Date of Inspection: 10/23/07RPA
Accompanied By: Robert Kish, senior consultant

LOCATION

Stream: Little Blue Run
Municipality: Greene Township
County: Beaver

Latitude: **40 ° 37 ' 39** " North
Longitude: **80 ° 30 ' 43** " West

USGS TOPO: East Liverpool, North OH-PA-WV **North:** 1.2 inches **West:** 2.4 inches

Directions

Mile	Instruction	For	Toward
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0.2	At exit 13B, take Ramp (RIGHT) onto SR-68 [State St]	7.0 mi	PA-68 / Midland
7.1	Take Ramp onto SR-168 [Shippingport Bridge]	0.8 mi	PA-168 / Shippingport
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11.4	Road name changes to Georgetown Rd	3.2 mi	
14.6	*Gate access required* Turn LEFT (West) onto Little Blue Hollow Rd	0.7 mi	
15.3	Turn LEFT (South) onto access road	0.5 mi	
15.8	**Arrive D04-049**		

OWNER: Frank Lubich
Site First Energy Generation Corp
Bruce Mansfield Plant
P.O. Box 128
Shippingport, PA 15077-0128
724-643-5000

Richard Sprecker, Environmental Supervisor
724-682-6852 office
spreckerr@firstenergycorp.com

Contact: Robert Kish, Senior Consultant
412-974-0749 (cell)
kishr@firstenergycorp.com

Alexander Daquila – emergency drill
724-682-6845 office
412-974-9575 cell
daquilaa@firstenergycorp.com

Engineer: Little Blue Run – d04-049
Stanley R. Michalski, P.G.
GAI Consultants, Inc.
385 East Waterfront Drive

Dam Number: d04-049 **Date**: 10/23/07

Homestead, PA 15120-5005
412-476-2000 ext 1420 Stanley R. Michalski
s.michalski@gaiconsultants.com

PERTINENT DATA

Type: Rock fill with impervious soil care
Height: 400 feet
Storage: 73,000 acre-feet
D.A.: 2.9 sq. miles
Class: A-1

PRESENT CONDITIONS

Crest	This is a curvilinear dam with the vertex pointed upstream. The crest is 2100 feet long by 50 feet wide at elevation 1100 with a maximum elevation of 1102 at the center of the dam. It is topped with a crushed stone access road. There is an upstream saddle dam.
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Emergency Spillway	The labyrinth weir crest emergency spillway is located along the left side of the dam. The base is at elevation 1092 and the crest is at elevation 1095. The approach is a trapezoidal channel with shallow bedrock that opens to the impoundment. To the right is a 36" diameter concrete pipe inlet with the invert at 1088. This pipe spillway outlet drops in elevation 400' within a 36" concrete pipe before entering the stilling basin at the toe of the dam
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Encroachments	
Site Restoration	
E & S Plan on Site	
E & S Controls	

Recent Correspondence and Action(s) on Previous Recommendations:
October 5, 2006
Bureau of Waterways Engineering
Mr. Richard F. Sprecker
Environmental Supervisor
Pennsylvania Power Company
PO Box 128
Shippingport, PA 15077-0128
Re: DEP File No. D04-049

Inspection Reports numbered 83 and 84, prepared by GAI Consultants, Inc., and which included the 2006 Annual Inspection Report for Little Blue Run Dam, were submitted by Pennsylvania Power Company on February 3, 2006, and September 7, 2006, respectively. These two reports incorporate observations made during the April 2005 and March 2006 time period.

We would emphasize the recommendations for monitoring the springs and slide-prone areas on both abutments, and the slide that recently occurred downstream of the stilling basin. *These results should be documented by its engineer in subsequent inspection reports.*

We continue to be concerned with the seepage conditions and stability of the left abutment. These concerns were discussed with you and GAI during the September 13, 2005, meeting held at our office in Harrisburg. As we stated during the meeting, the abutment's steep slope, about 1.8H:1V, the numerous seepage discharges, the embankment plan shows about 20 springs, and the two episodes of slope movements, in December 2001 and August 2004, are our overriding concerns. The best-fit parabolic curve for the total seepage, which is presented as Figure 3 in report number 84, implies a decreasing trend for seepage flows is certainly one good piece of evidence that reduces our concern. We do list the following points that may be at variance with this implication.

1) Most of the decrease in total seepage is the result of the reduction in flow from the toe drain (TD). This reduction appears to have occurred after the modifications to the flume were made in

October 2005. It seems plausible that the modifications could have removed a source of seepage.

2) Although the report narrative cites a decrease in the flows in the upper left abutment and right abutment weirs, the Figure 3 graph could be used to draw a horizontal line through the data points that imply no change.

3) The reduction in seepage flow for 2005 and 2006 may be the result of much lower precipitation during this time period as compared to 2003 and 2004. During both the 2003 and 2004 summer months the total precipitation was about 39 inches, which is much above the 23-inch average cited in the reports.

4) The flow readings for the lower left abutment weir are not included in the total seepage. Also, as we noted during our September meeting this weir has been reported as leaking. Did the rehabilitation work completed in October include improvements to the weir? Report number 84 does cite a slight increase in seepage flow for this weir.

We look forward to continued discussion with you and GAI about our seepage and stability concerns for the left abutment. We will be contacting Stan Michalski within a couple of weeks to schedule a site visit for the months of October or November. At least two members of Dam Safety, Bill Franz and Roger Adams, and a couple representatives from our Southwest Regional office will attend. We would appreciate the opportunity to inspect the current construction of the emergency spillway and the placing of sludge behind the geotubes in the Pennsylvania and West Virginia fingers at that time. If you or GAI have any questions, please contact Bill Franz, P.E., P.G., at 717-772-5958 or wfranz@state.pa.us.

James D. Boswell, P.E.

January 11, 2006
Bureau of Waterways Engineering
Brian Warnaka
Pennsylvania Power Company
Bruce Mansfield Plant
Re: DEP File No. D04-049

Receipt is acknowledged of the Dam Repair Completion Certification, as-built drawings, photographic documentation, and other information submitted by GAI Consultants for the modification of the secondary spillway outlet structure and the stilling basin weir and outlet channel, and the construction of a pipeline from the secondary spillway outlet structure to the stilling basin at the Little Blue Run Dam, located across Little Blue Run in Green Township, Beaver County. This work was authorized by our letter of June 30, 2005.

We have reviewed the submitted Completion Certification and other information. Based upon this information, all construction requirements of the Department's June 30, 2005, "Letter of Authorization" have been fulfilled. The Department considers construction activities at the dam completed.

Tyson R. Clouser

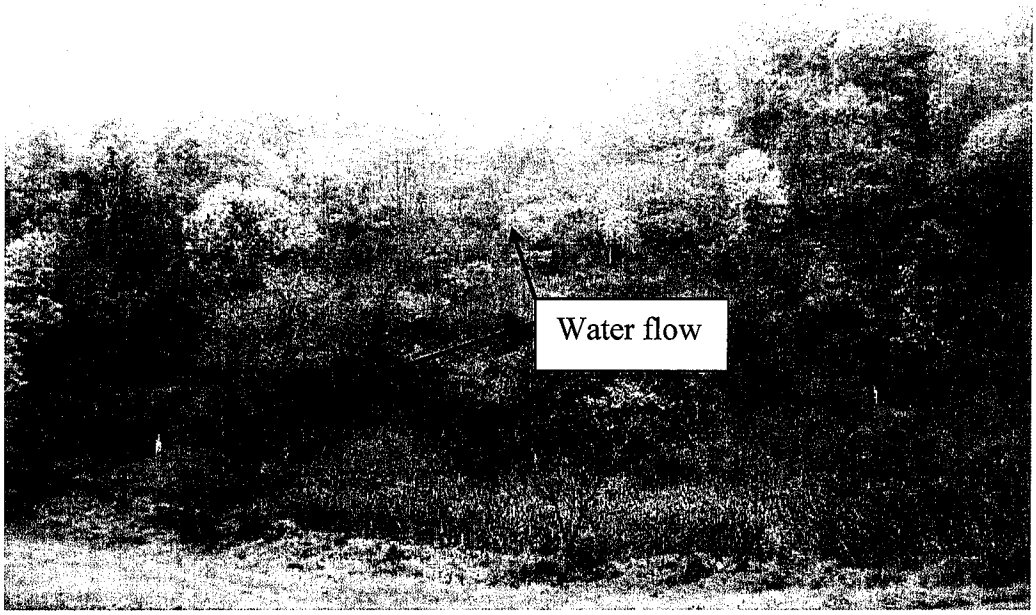
Comments: The modification of the emergency spillway is complete. The left abutment seepage continues to be a concern.

Submitted by: Lawrence Busack, SWRO
This report is solely developed to monitor this facility for compliance with the Dam Safety Program. It is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-

Dam Number: d04-049 **Date**: 10/23/07

depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. Use of any information within this report requires the user to independently verify the observations, recommendations, and conclusions.

Lawrence D Burns
10/23/07



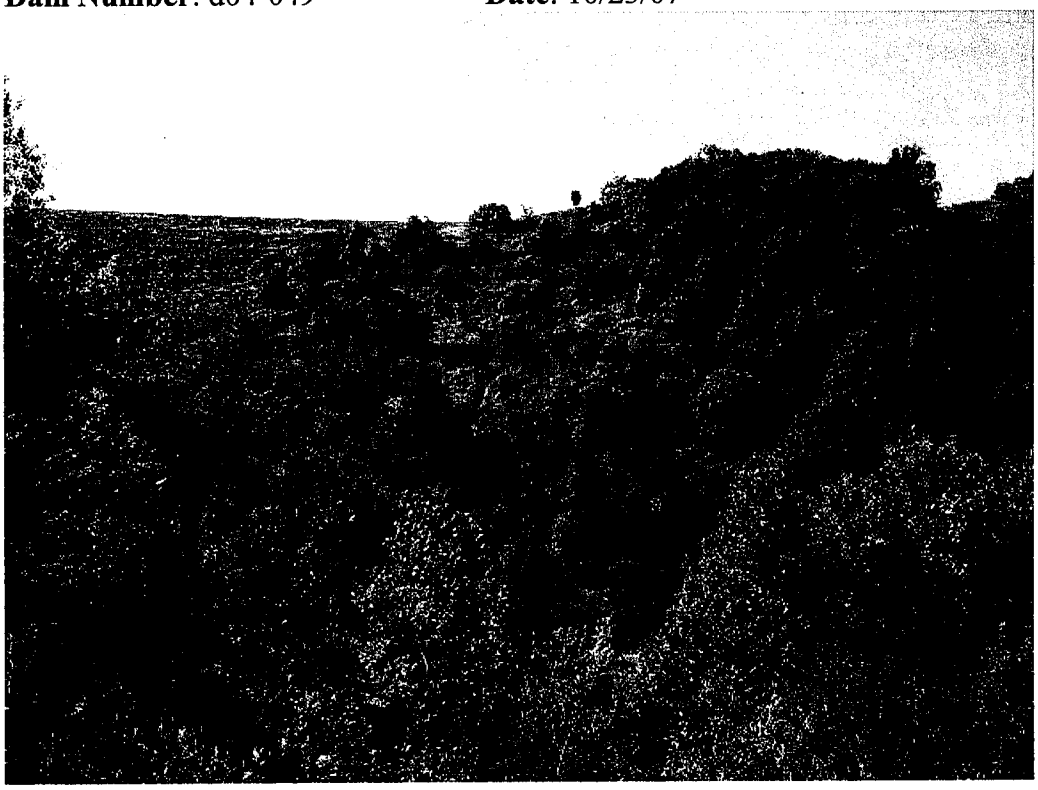
d04-049 10/23/07 left abutment

Dam Number: d04-049 **Date**: 10/23/07
Comparison d04-049 9/21/06 lower end of left abutment looking toward dam

d04-049 10/23/07 left abutment

d04-049 10/23/07 left abutment

Dam Number: d04-049 **Date**: 10/23/07



Comparison d04-049 9/21/06 left abutment

d04-049 10/23/07 left abutment

Dam Number: d04-049 **Date**: 10/23/07

d04-049 10/23/07 left abutment

Comparison d04-049 9/21/06 left abutment from toe

Dam Number: d04-049 **Date**: 10/23/07

d04-049 10/23/07 discharge from left abutment

d04-049 10/23/07 impoundment left of spillway

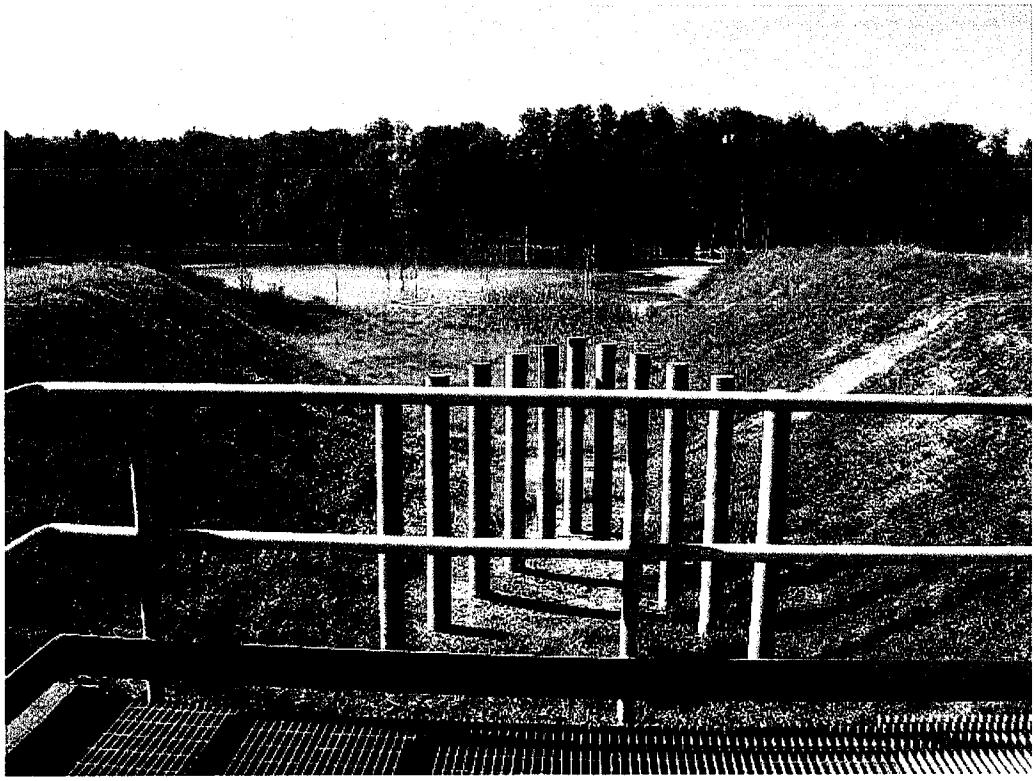
Dam Number: d04-049 **Date**: 10/23/07

Comparison d04-049 9/21/06 approach to emergency spillway

d04-049 10/23/07 spillway approach

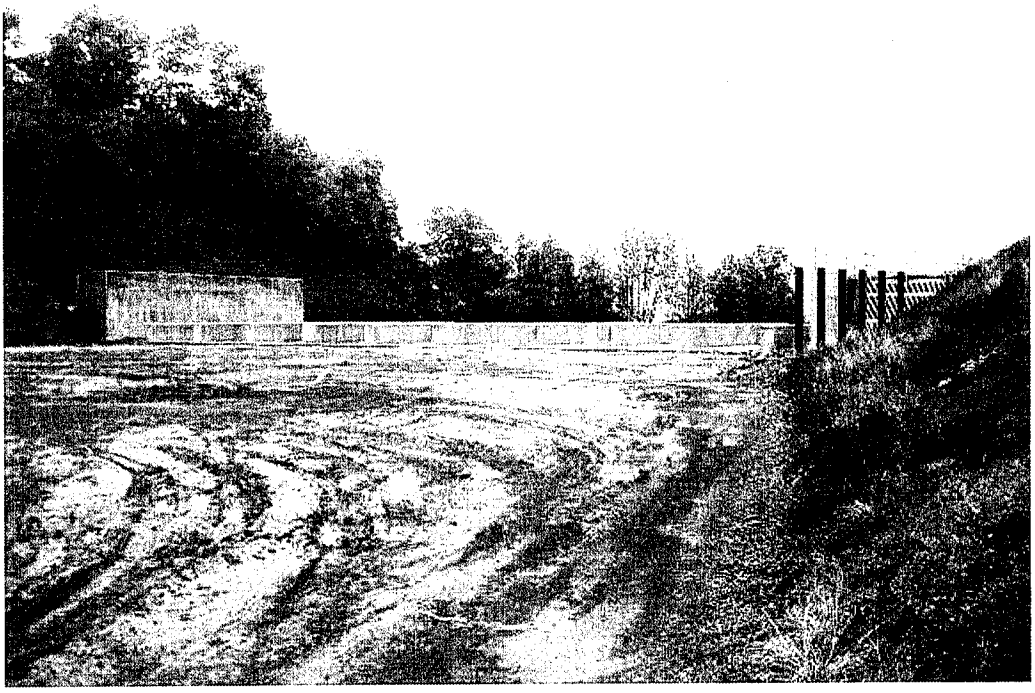
Dam Number: d04-049 **Date**: 10/23/07

d04-049 10/23/07 spillway approach

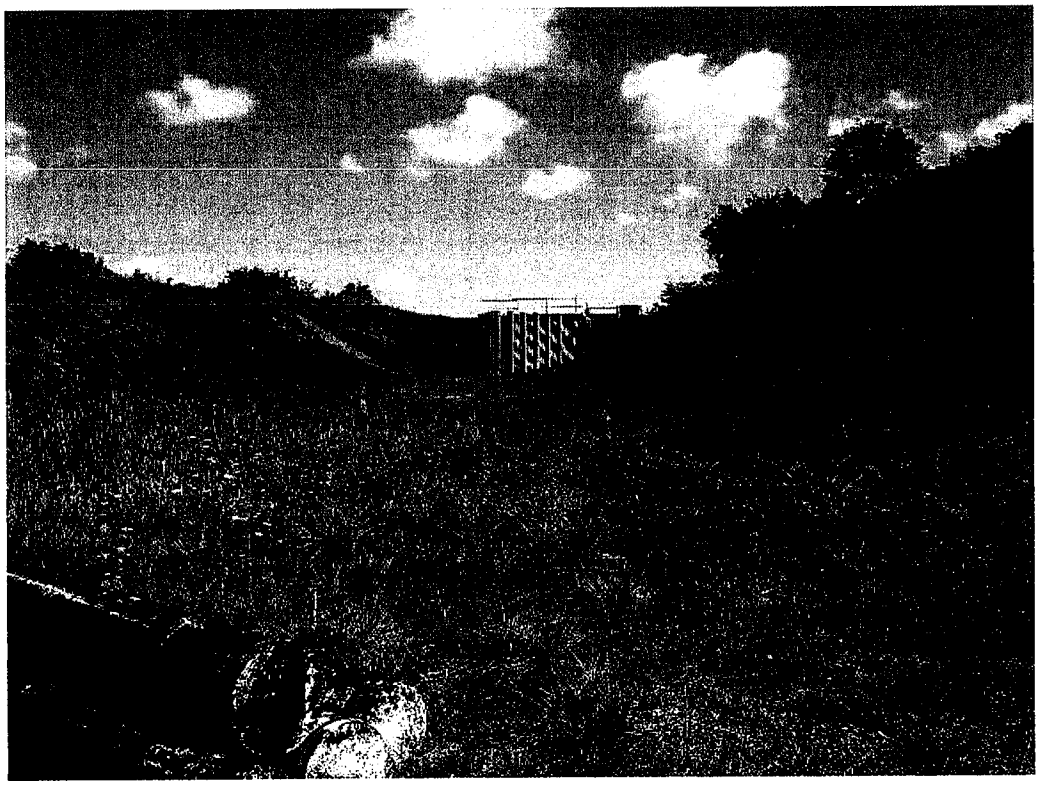


Comparison d04-049 9/21/06 left primary spillway looking toward approach

Dam Number: d04-049 **Date**: 10/23/07



d04-049 10/23/07 looking toward spillway from approach



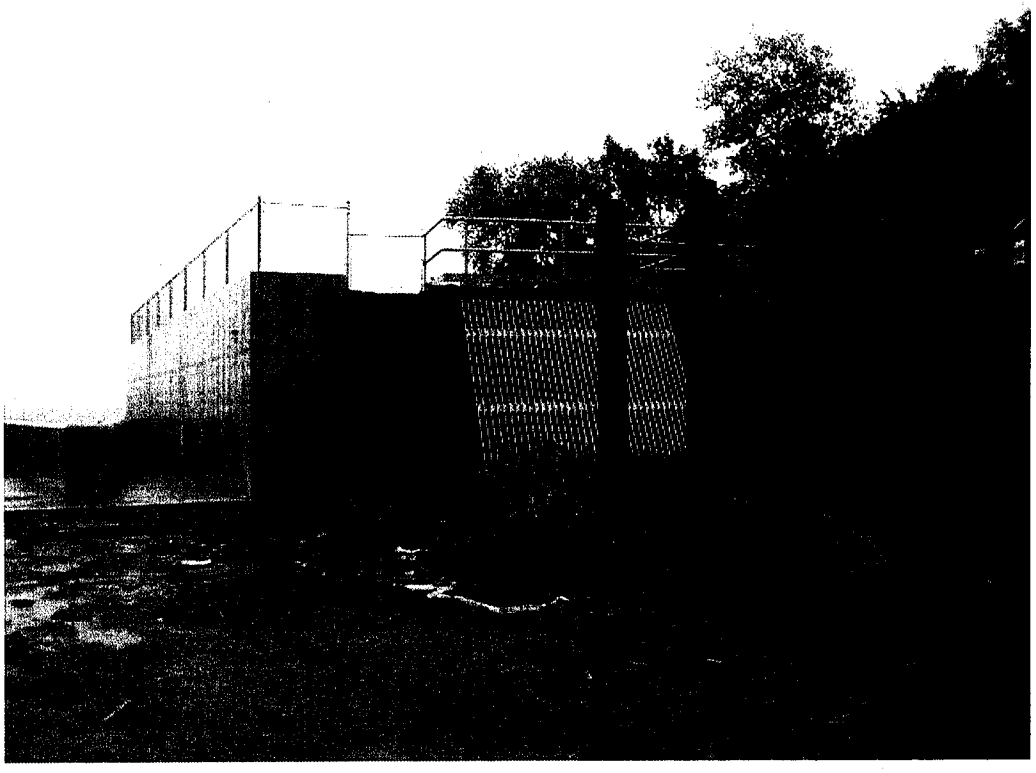
Comparison d04-049 9/21/06 looking toward left primary spillway from approach

Dam Number: d04-049 **Date**: 10/23/07

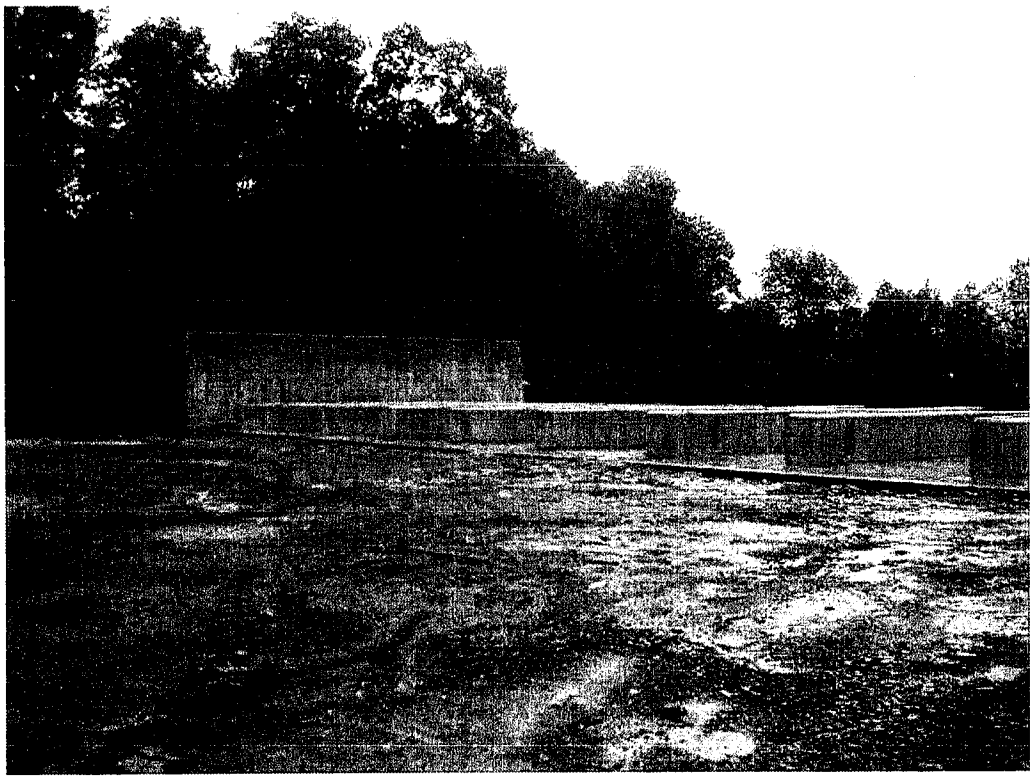
Comparison d04-049 9/21/06 emergency spillway looking DS

d04-049 10/23/07 US spillway – right side

Dam Number: d04-049 **Date**: 10/23/07

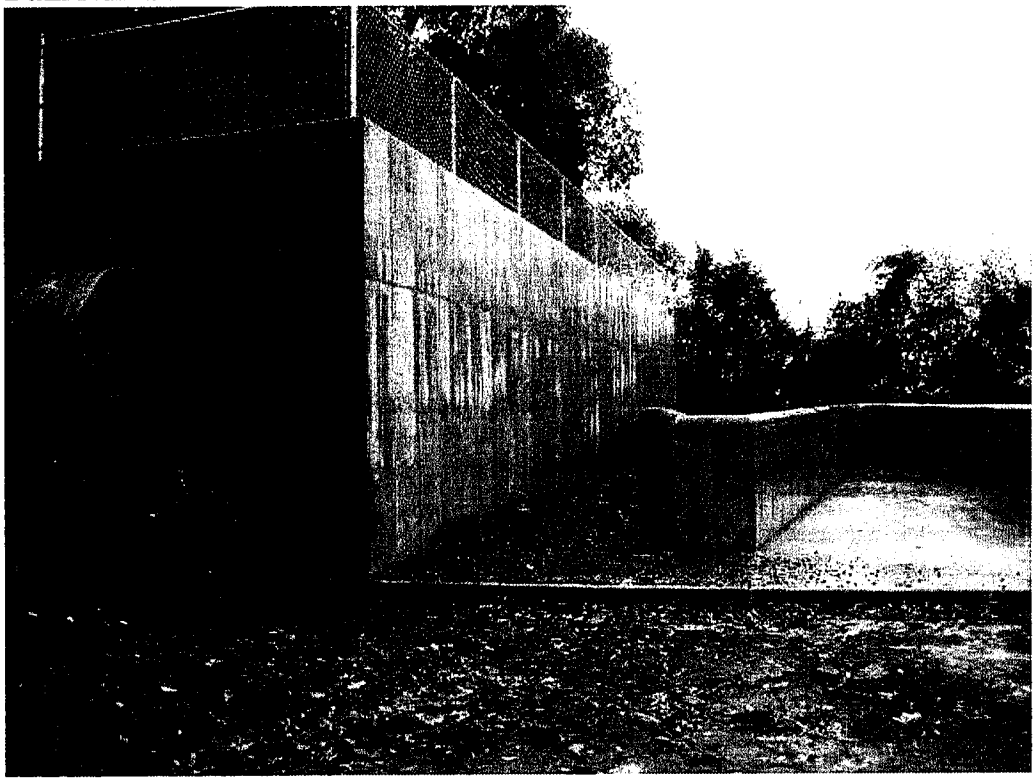


d04-049 10/23/07 spillway drain on right



d04-049 10/23/07 US spillway – left side

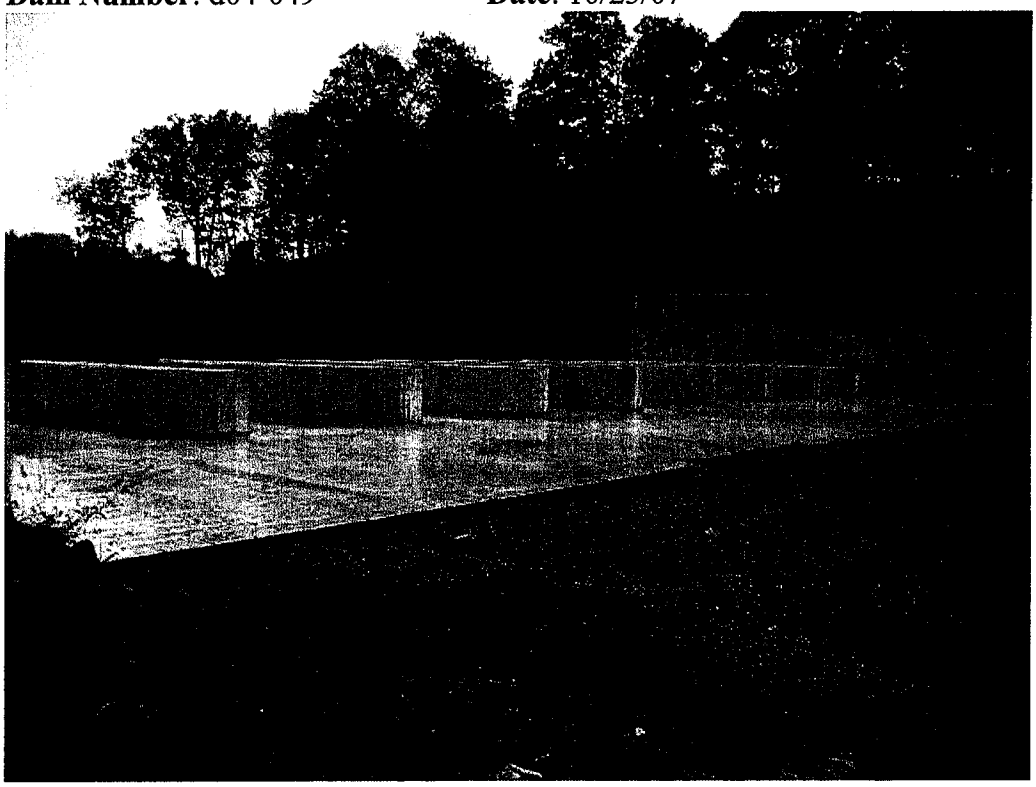
Dam Number: d04-049 **Date**: 10/23/07



d04-049 10/23/07 spillway – left abutment

d04-049 10/23/07 DS end of spillway from left

Dam Number: d04-049 **Date**: 10/23/07



d04-049 10/23/07 DS end of spillway from left

d04-049 10/23/07 DS end of spillway from right

3140-FM-W E0001 6/2005

DEP DATA RECORDS	Inspection # **1580410**
Complaint #	Enforcement #
Dam # **D04-049**	Date **11/20/06**

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING
DIVISION OF DAM SAFETY

DAM SAFETY INSPECTION NOTICE

DEP Office Address	Southwest Regional Office Phone 412-442-4315 400 Waterfront Drive Pittsburgh, PA 15222-4745	Dam Permit or I.D. # **d04-049** Dam or Project Name **Little Blue Run** County **Beaver**
Owner or Permittee	**Richard Sprecker, Environmental Supervisor** **First Energy Generation Corp**	Municipality **Greene Township** Stream **Little Blue Run**
Complete Mailing Address	**Bruce Mansfield Plant** **P.O. Box 128** **Shippingport, PA 15077-0128**	Take GPS readings at the center of the crest of the dam. Latitude: **40 ° 37 ' 39 "** North Longitude: **80 ° 30 ' 43 "** West

Type of Inspection: ☐ ADMIN – Administrative/File Review ■ CONST – Construction Progress ☐ FLWUP – Follow up
☐ CEI – Compliance Evaluation ☐ DAM12 – Category 1 or 2 dam ☐ INCDT – Incident response
☐ COMPL – Complaint inspection ☐ DAM3 – Category 3 dam ☐ OTHER_____

Location/ Appurtenance	Insp.	Condition OK	Condition Concern	Comment/Explain Concern	Violation Check if yes	Cite 25 Pa. Code
Crest	☐	☐	☐		☐	
Upstream Face	☐	☐	☐		☐	
Downstream Face	☐	☐	☐		☐	
Outlet Structure	☐	☐	☐		☐	
Outlet Conduit	☐	☐	☐		☐	
Primary Spillway	☐	☐	☐		☐	
Emergency Spillway	■	■	☐	**Excavation complete. Concrete foundation for Labyrinth weir being placed.**	☐	
Spillway Channels	☐	☐	☐		☐	
Downstream Toe Area	☐	☐	☐		☐	
Encroachments	☐	☐	☐		☐	
Site Restoration	☐	☐	☐		☐	
E & S Plan on Site	☐	☐	☐		☐	
E & S Controls	☐	☐	☐		☐	
Left Abutment					☐	

Inspection Results Code:				
	☐ NOVIO (No significant violations noted)	☐ OUTST (Outstanding violations, notice req'd)	☐ RECUR (Recurring violations)	■ REPAR (Repairs or upgrade required)
	☐ VIOIC (Viols noted and immediately corrected	☐ VIOLS (Violation(s) noted)	☐ VOV (New and outstanding violations noted	☐ VRV (New and recurring violations noted)
	☐ DVN (deminimus violations noted)			

Violations Noted? ☐ Yes ☐ No Field Notice of Violation? ☐ Yes ☐ No Compliance Order? ☐ Yes ☐ No

Remarks: This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. The inspector's full report is available by contacting the DEP office noted above.

DEP Inspector was accompanied by		DEP Rep: Lawrence Busack	Date:
☐ Owner	■ Engineer for Owner or Permittee **GAI – Phil**	(signature)	**11/20/06**
☐ Permittee	■ Other **Contractor Thomas Construction**	(print name) **Bill Bell, superintendent** Phone: **24-992-1725 (cell)**	Time:

☐ White – Owner, Permittee, or Representative ☐ Yellow – Division of Dam Safety, Central Office ☐ Pink – DEP Regional File

■

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

OWNER: Brian Warnaka
Site First Energy Generation Corp
Bruce Mansfield Plant
P.O. Box 128
Shippingport, PA 15077-0128
724-643-5000

Richard Sprecker, Environmental Supervisor
Contact: Robert Kish, Senior Consultant
724-682-6852 office
412-974-0749 (cell)
kishr@firstenergycorp.com

Engineer: Stanley R. Michalski, P.G.
GAI Consultants, Inc.
385 East Waterfront Drive
Homestead, PA 15120-5005
412-476-2000 ext 1420 Stanley R. Michalski
s.michalski@gaiconsultants.com

Contractor: Bill Bell, superintendent
Thomas Construction
Grove City, PA
724-992-1725

Comments: Excavation of the left spillway has been completed. The trench for the weir had been excavated into rock. The forming and the re-bar was in place, and most of the water stop has been installed.

While I was there, they placed the lower portion of the left trench in a continuous pour. The concrete tests were performed on a single batch taken from the 3rd truck. These tests showed the air content at 1% (vs the desired of 2%). The slump was about 5 ¾ inches and 9 cylinders were prepared for compression testing. The air temperature was about 40 and conditions were damp.

GAI was monitoring the concrete placement. They decided to add an agent to increase the air content before completing the upper portion of the left trench placement.

Photos of the geology of the abutment are included with this report.

Submitted by: Lawrence Busack, SWRO
This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

d04-049 11/20/06 spillway approach

d04-049 11/20/06 spillway from approach

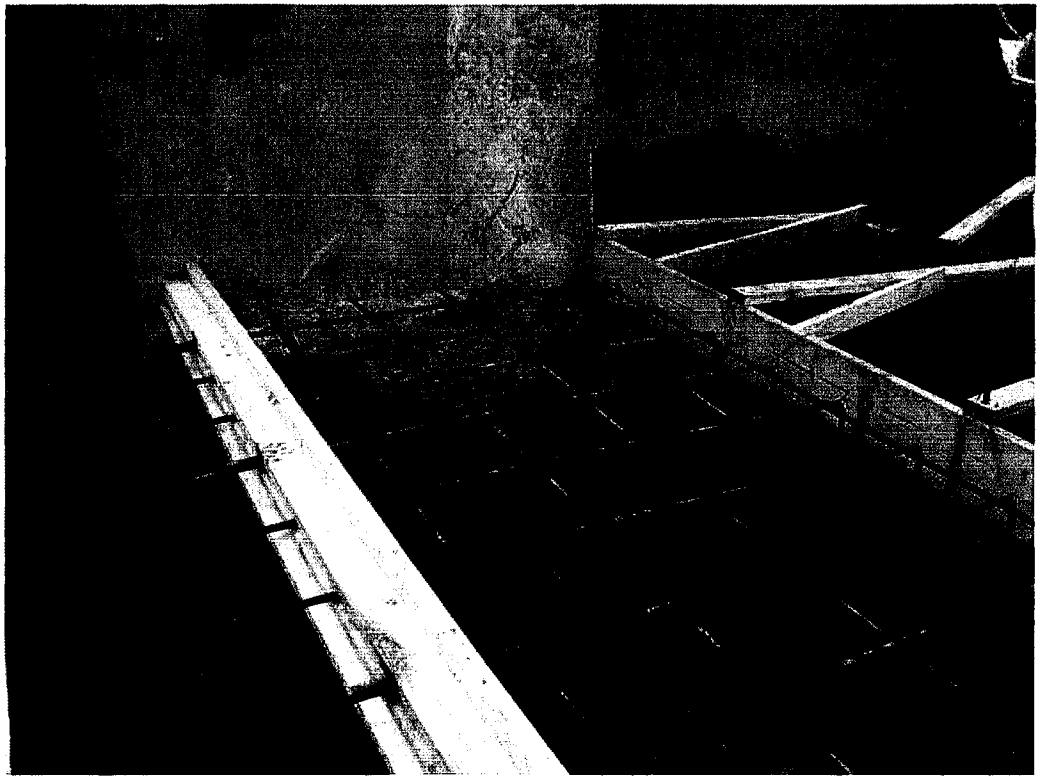
Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

d04-049 11/20/06 DS notch for right spillway wall

d04-049 11/20/06 looking from right DS notch US to existing wall

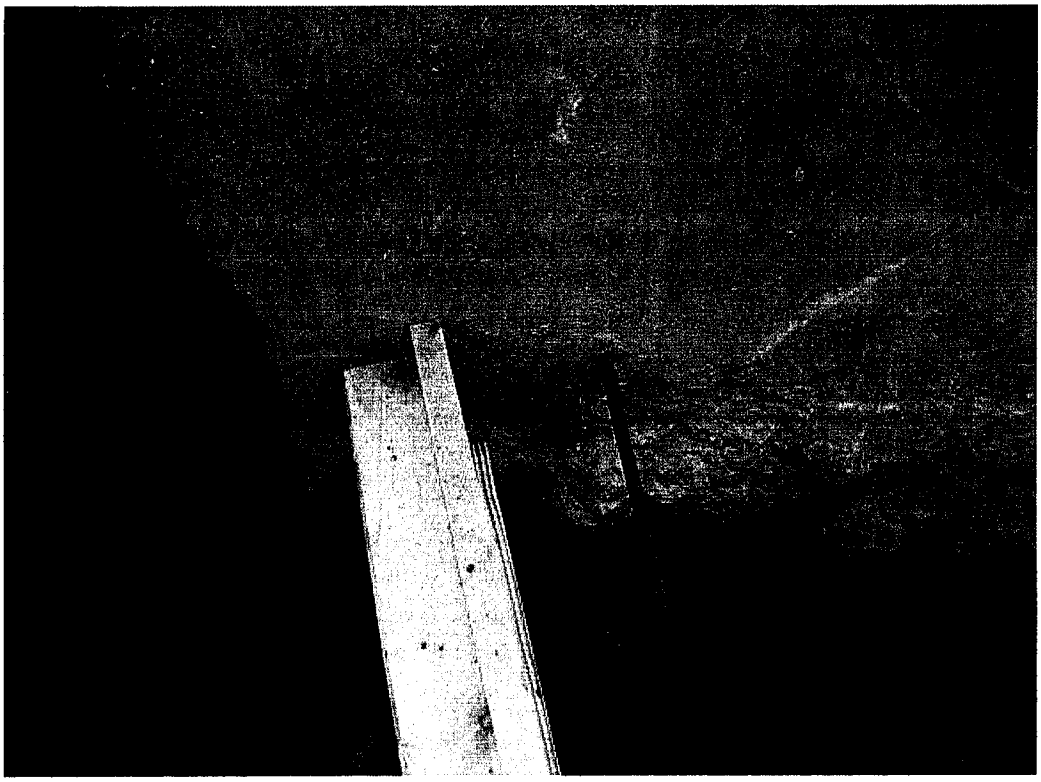
Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

d04-049 11/20/06 forming at right wall – note waterstop

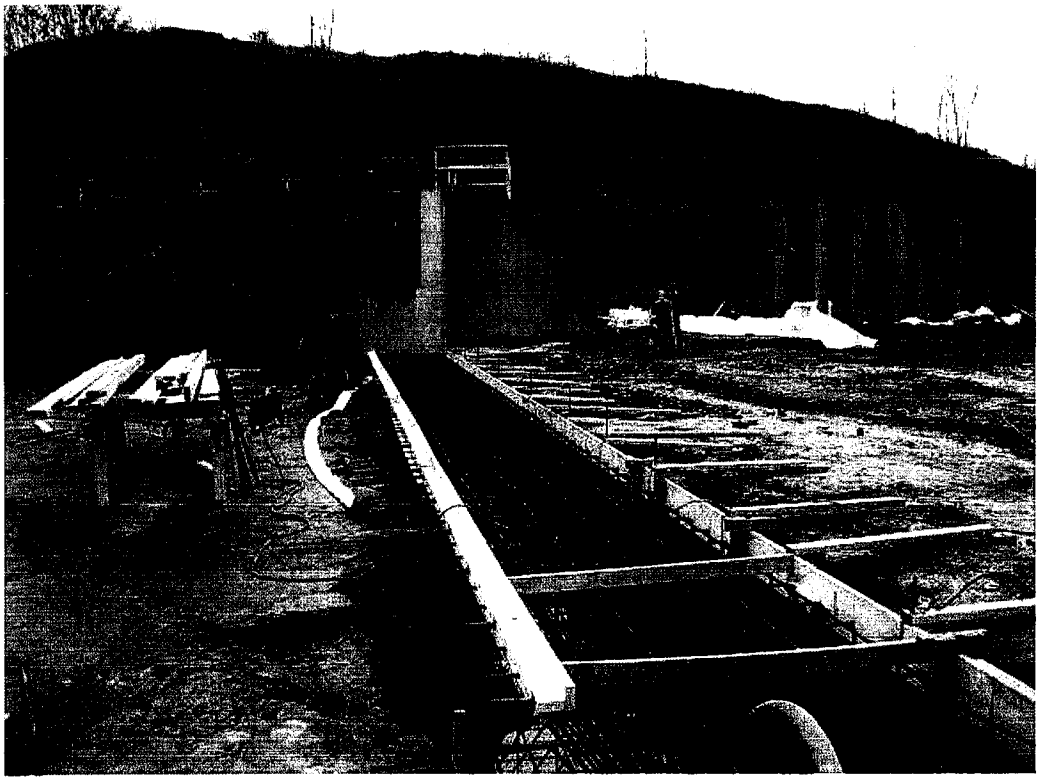


d04-049 11/20/06 forming at right wall

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

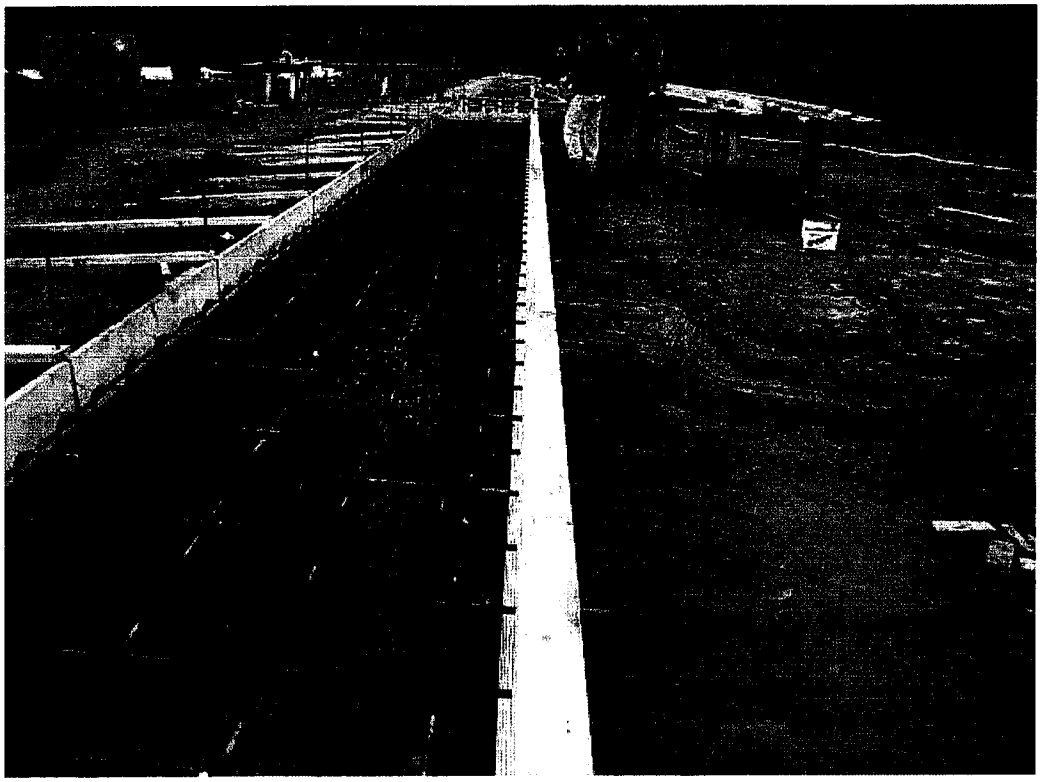


d04-049 11/20/06 forming at right wall – gap with waterstop will be filled with expansive material



d04-049 11/20/06 forming looking toward right wall

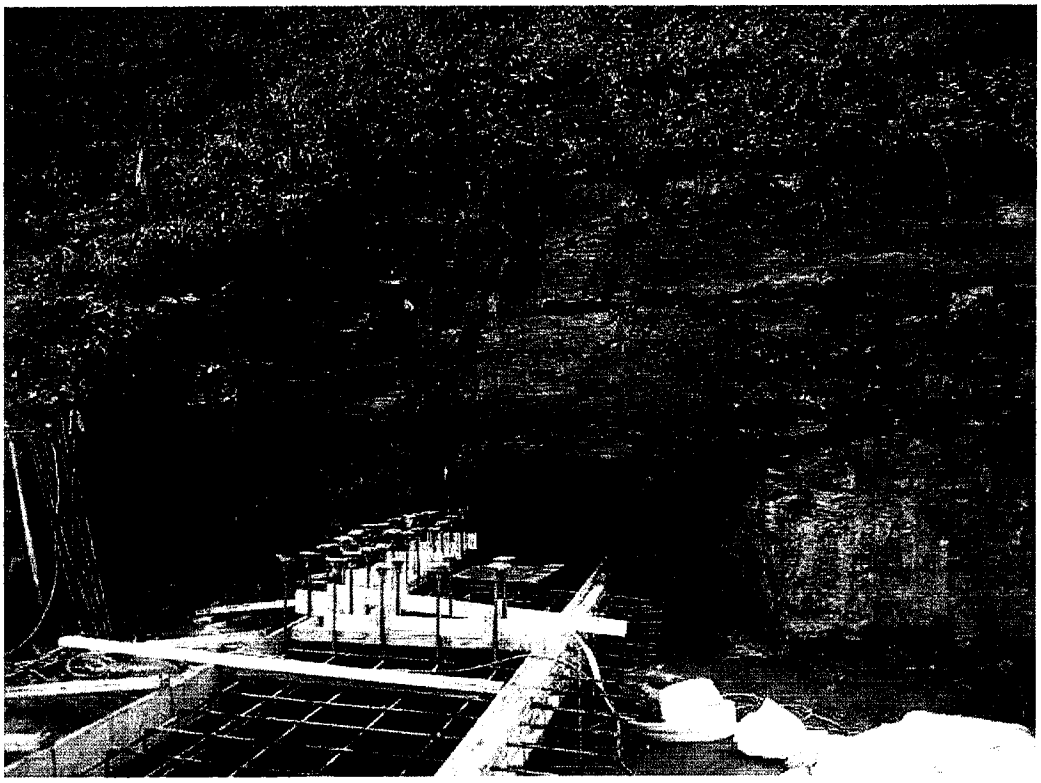
Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410



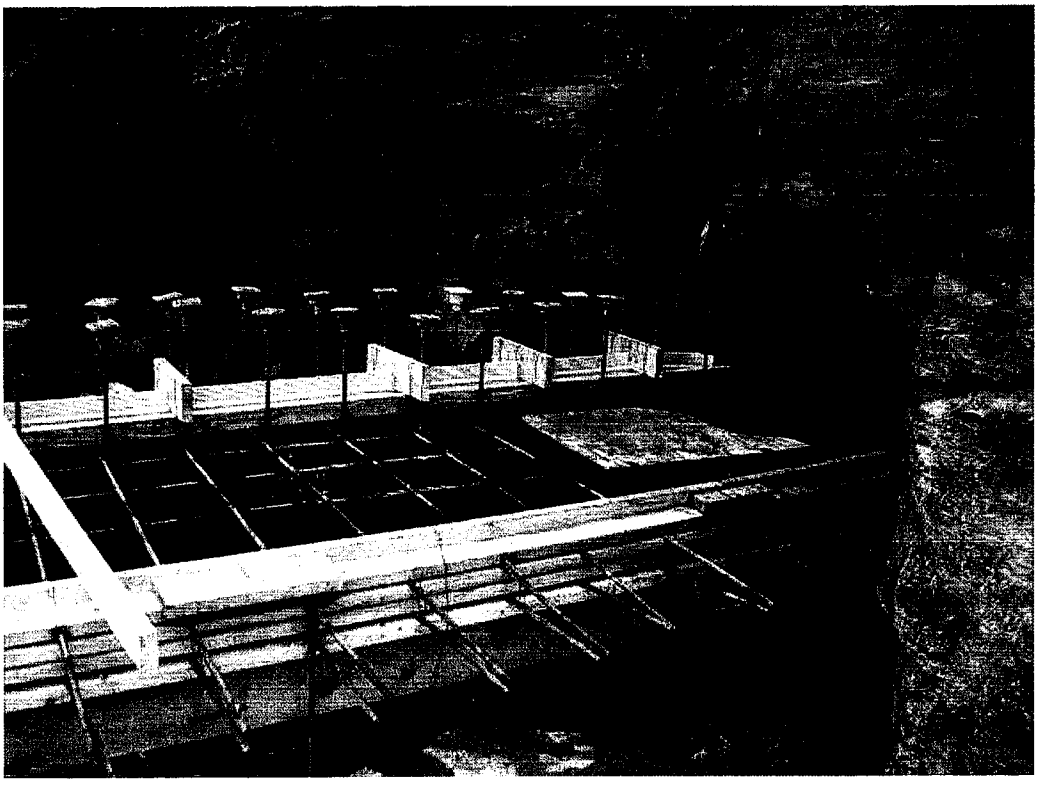
d04-049 11/20/06 forming looking toward left wall

d04-049 11/20/06 left US wall notch

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

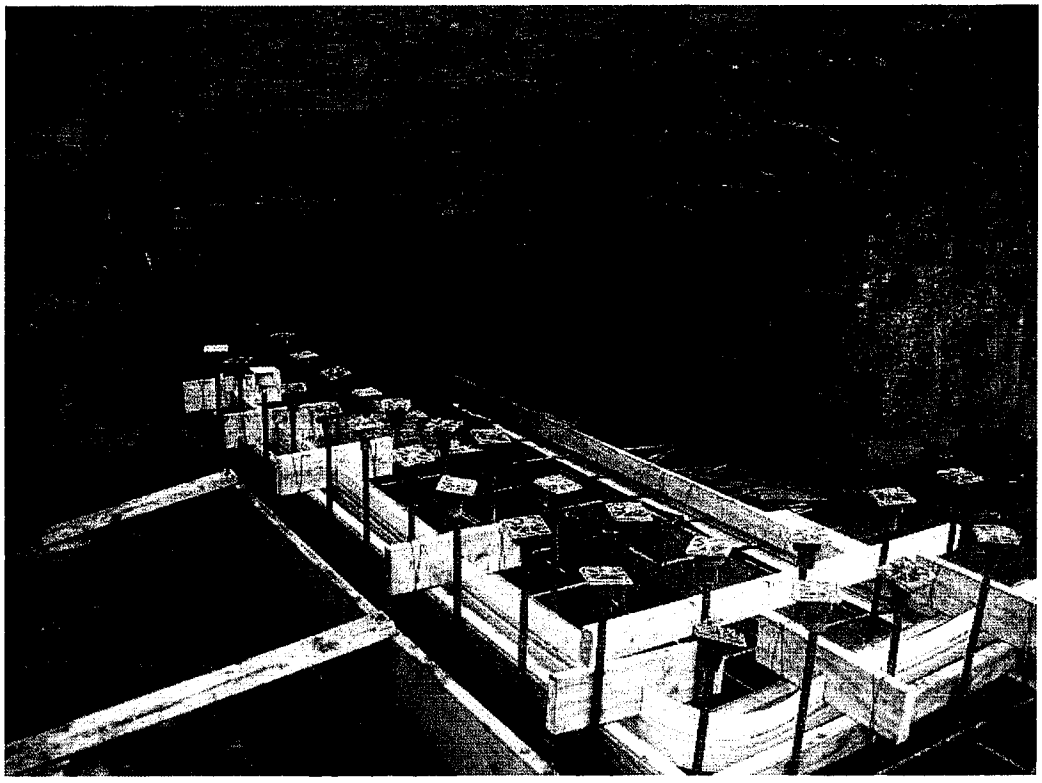


d04-049 11/20/06 left US wall notch

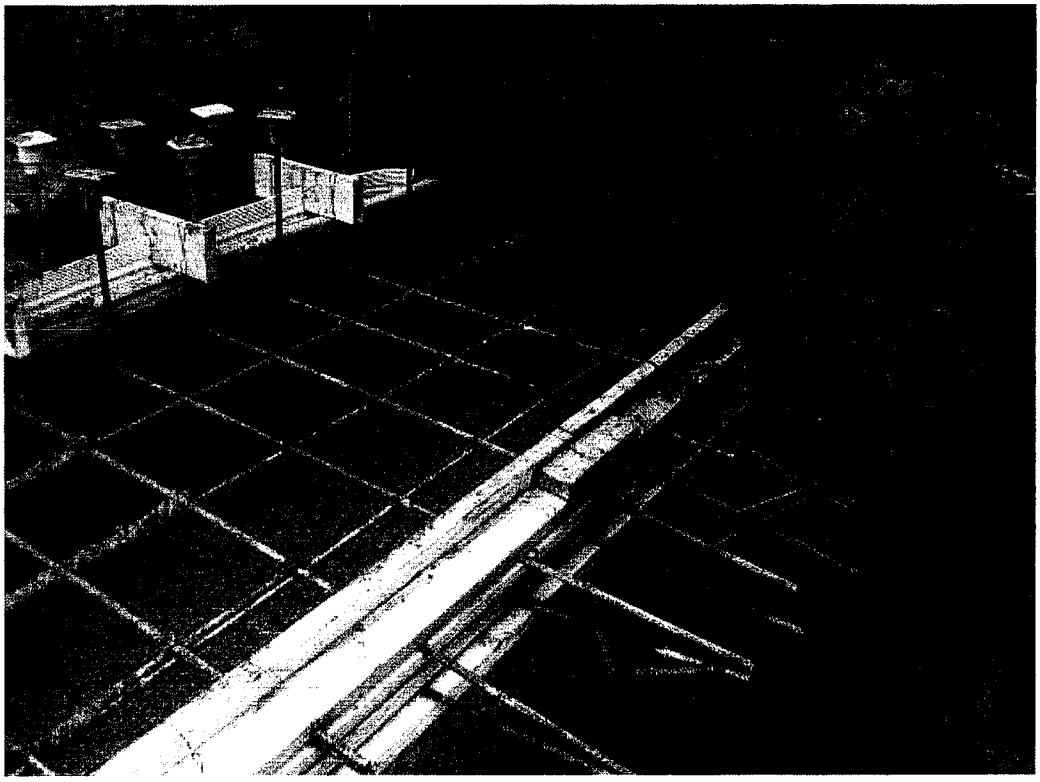


d04-049 11/20/06 left US wall notch

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

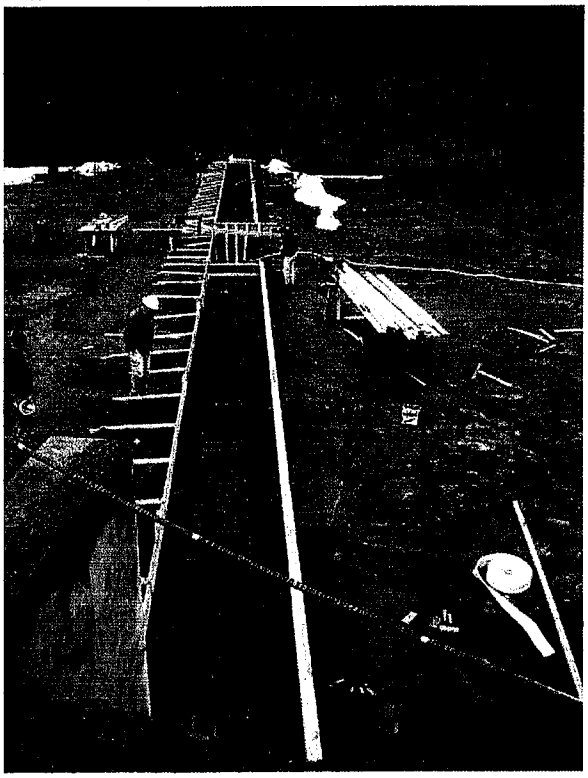


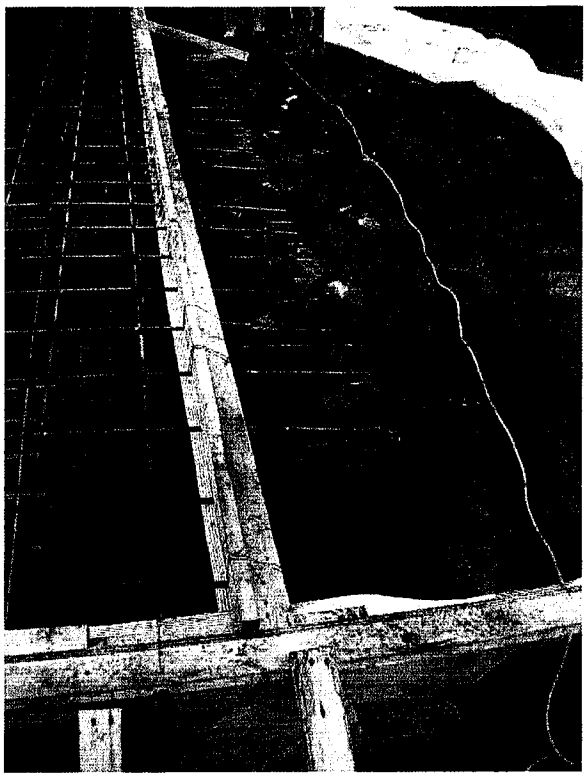
d04-049 11/20/06 left US wall notch



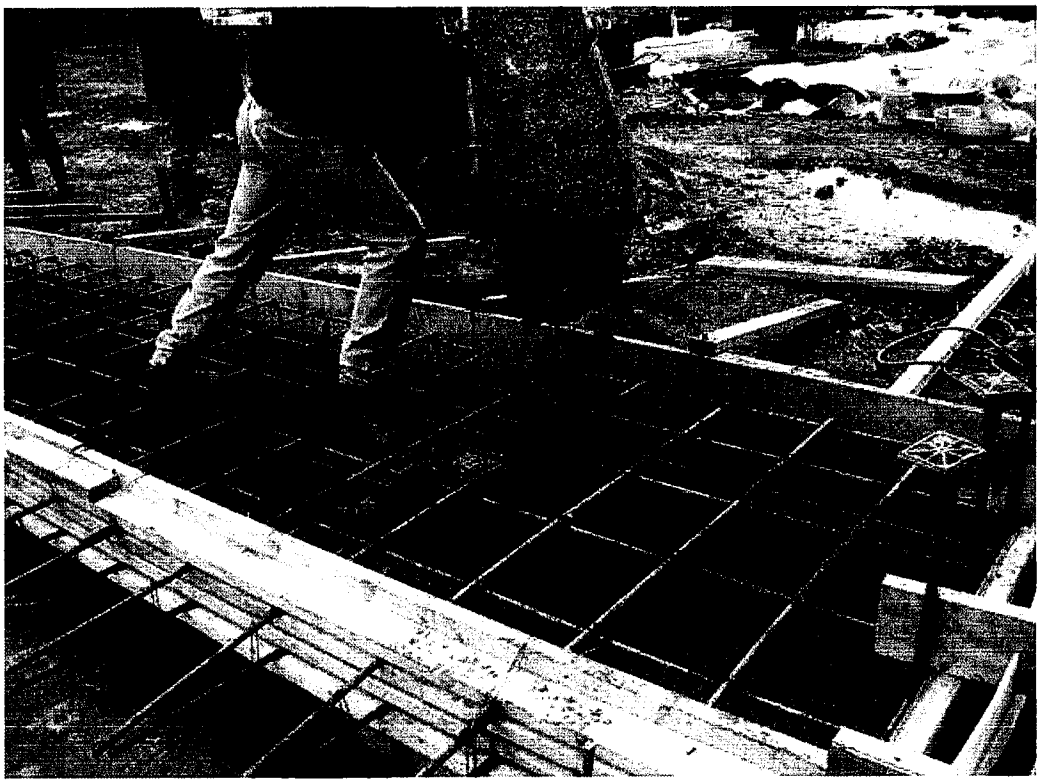
d04-049 11/20/06 lower portion of left US notch is ½ filled with concrete

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410





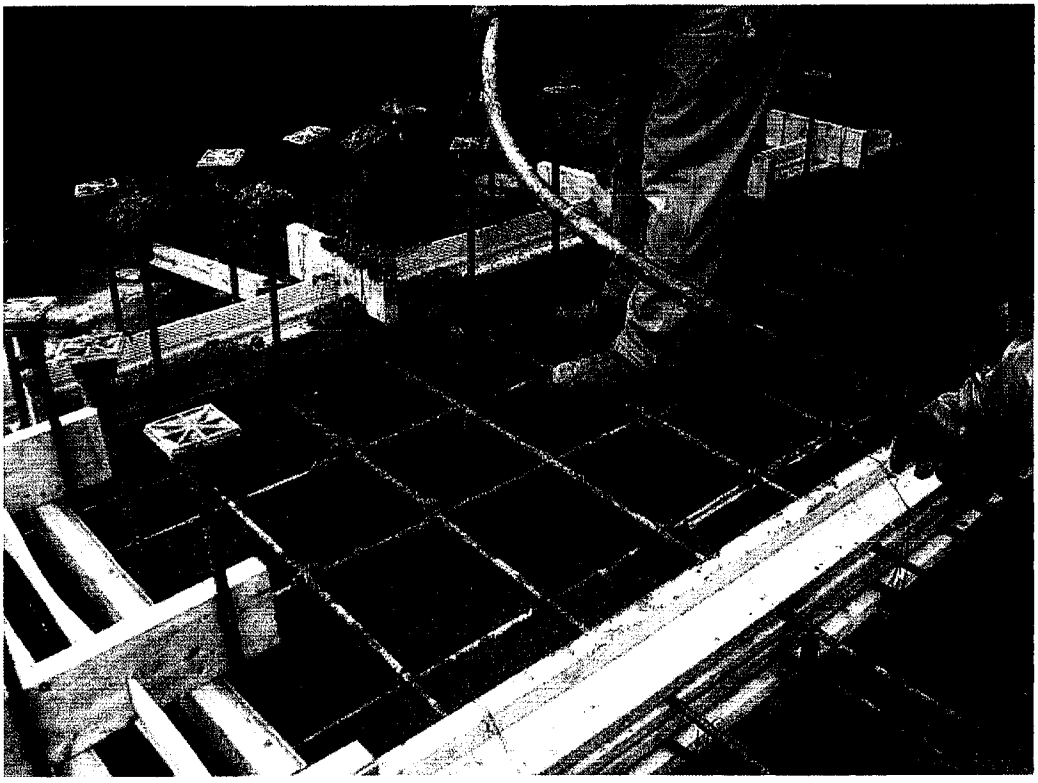
d04-049 11/20/06 forming of weir – looking from right to left – note – waterstop in place



d04-049 11/20/06 pouring the lower ½ of the left side

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

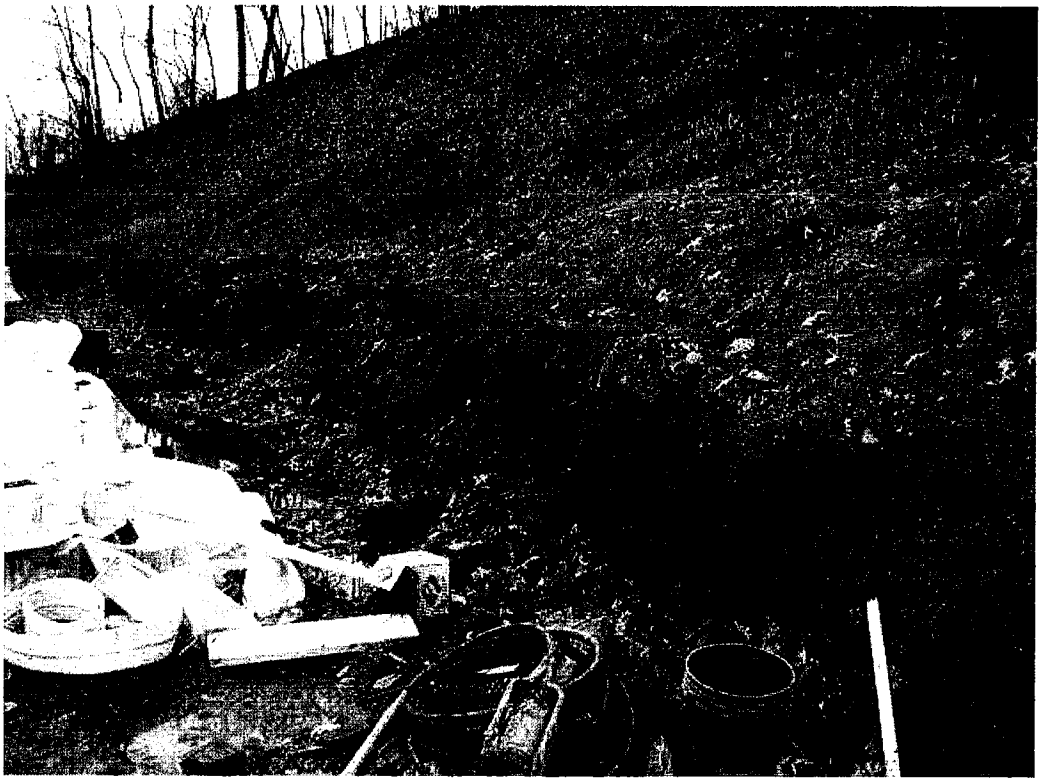
d04-049 11/20/06 pouring the lower ½ of the left side



d04-049 11/20/06 vibrating the concrete

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

d04-049 11/20/06 the lower ½ of the left side is almost complete



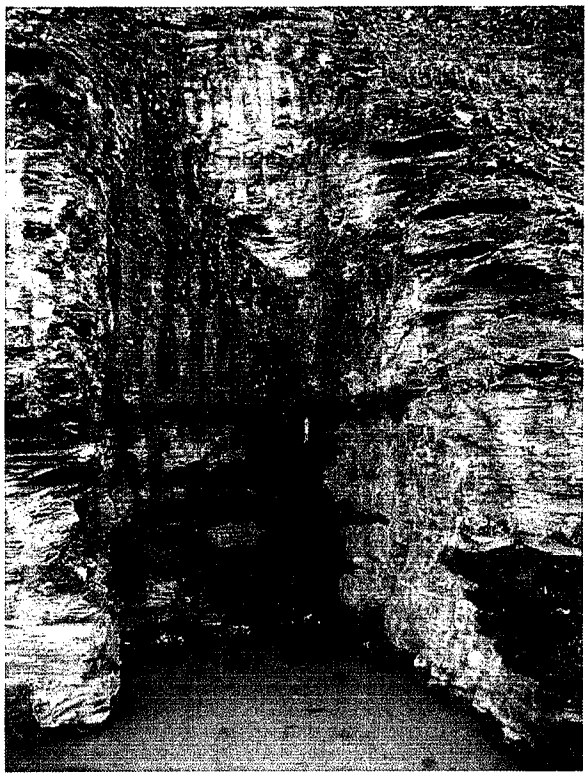
d04-049 11/20/06 left abutment US of weir

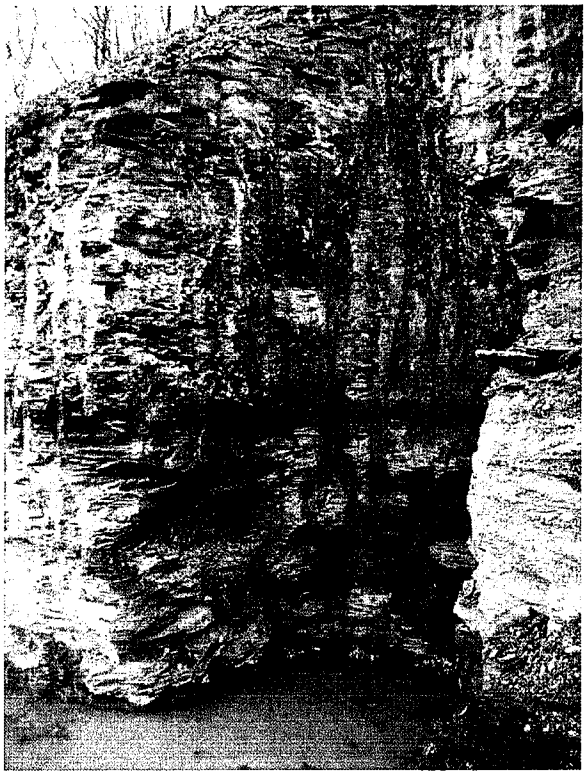
Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

d04-049 11/20/06 DS of weir from right – showing joints in the abutment

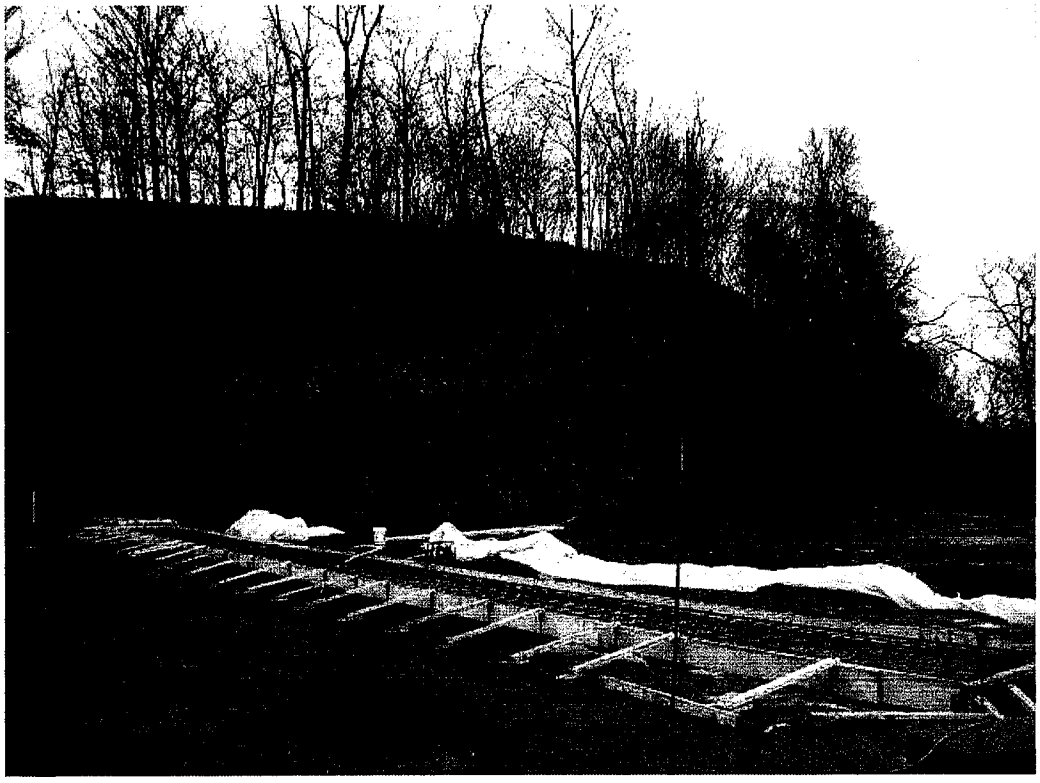
d04-049 11/20/06 DS of weir on left side

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410



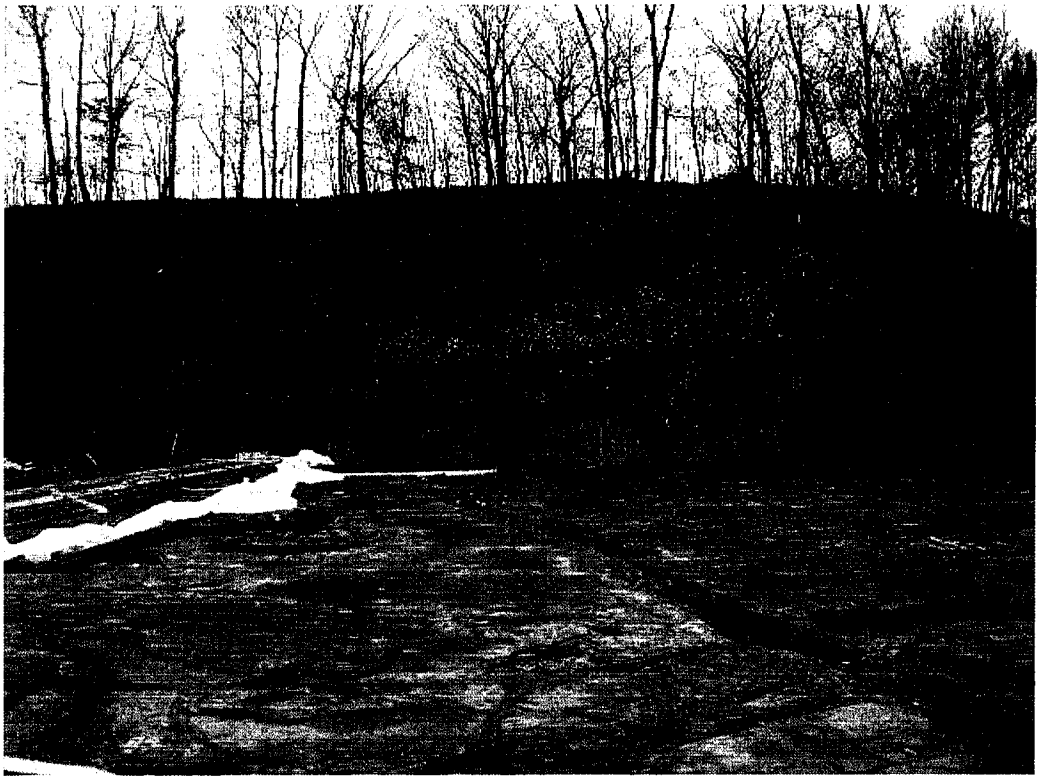


d04-049 11/20/06 notch for DS left wall – showing vertical joint

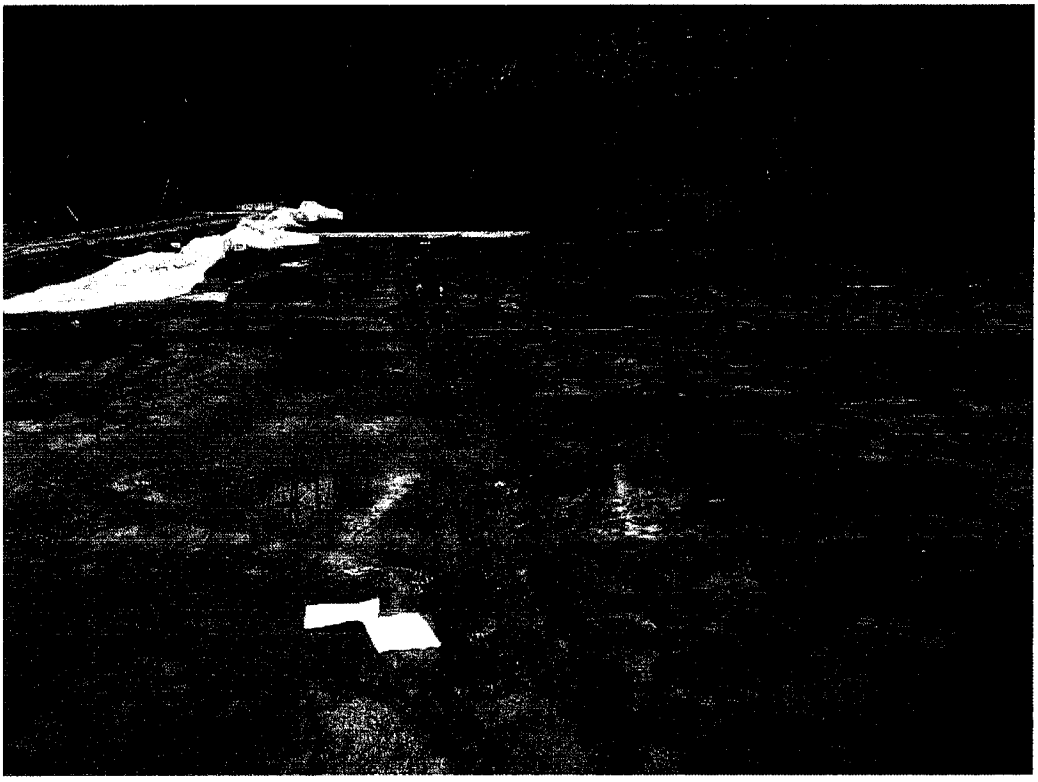


d04-049 11/20/06 rock vertical joint structure on left abutment

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410



d04-049 11/20/06 rock floor joints & left abutment joints



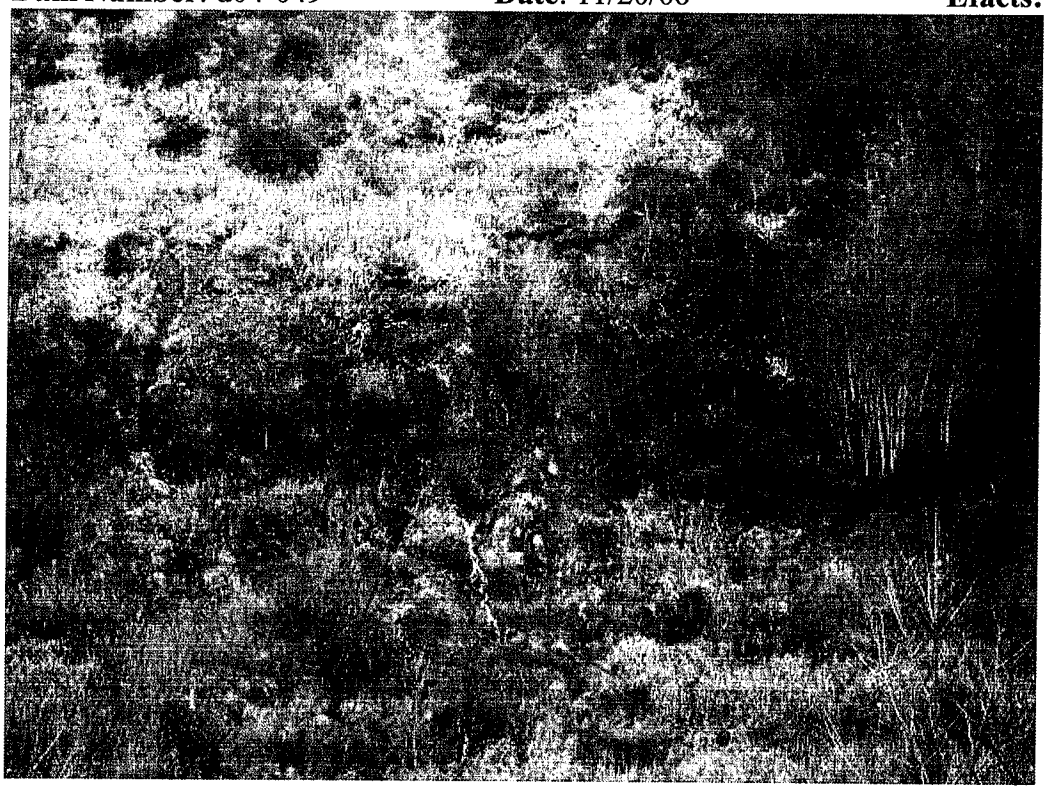
d04-049 11/20/06 rock joint structure DS of weir

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410

d04-049 11/20/06 rock joint structure looking right – 8.5 x 11 inch paper for scale

d04-049 11/20/06 rock joint structure looking right – 8.5 x 11 paper for scale

Dam Number: d04-049 **Date**: 11/20/06 **Efacts:** 1580410



d04-049 11/20/06 left dam abutment – spillway is further to the left (right in photo)

3140-FM-W E0001 6/2005

DEP DATA RECORDS	Inspection # **1567218**
Complaint #	Enforcement #
Dam # **D04-049**	Date **9/21/06**

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING
DIVISION OF DAM SAFETY

DAM SAFETY INSPECTION NOTICE

DEP Office Address	Southwest Regional Office Phone 412-442-4315 400 Waterfront Drive Pittsburgh, PA 15222-4745	Dam Permit or I.D. # **d04-049** Dam or Project Name **Little Blue Run** County **Beaver**
Owner or Permittee	**Richard Sprecker, Environmental Supervisor** **First Energy Generation Corp**	Municipality **Greene Township** Stream **Little Blue Run**
Complete Mailing Address	**Bruce Mansfield Plant** **P.O. Box 128** **Shippingport, PA 15077-0128**	Take GPS readings at the center of the crest of the dam. Latitude: **40 ° 37 ' 39 "** North Longitude: **80 ° 30 ' 43 "** West

Type of Inspection: ☐ ADMIN – Administrative/File Review ☐ CONST – Construction Progress ☐ FLWUP – Follow up
☐ CEI – Compliance Evaluation ■ DAM12 – Category 1 or 2 dam ☐ INCDT – Incident response
☐ COMPL – Complaint inspection ☐ DAM3 – Category 3 dam ☐ OTHER_____

Location/ Appurtenance	Insp.	Condition OK	Condition Concern	Comment/Explain Concern	Violation Check if yes	Cite 25 Pa. Code
Crest	■	■	☐		☐	
Upstream Face	■	■	☐		☐	
Downstream Face	■	☐	■	**Seepage on left DS abutment**	☐	
Outlet Structure	☐	☐	☐	**Same as primary spillway**	☐	
Outlet Conduit	☐	☐	☐	**Same as primary spillway**	☐	
Primary Spillway	■	■	☐		☐	
Emergency Spillway	■	■	☐		☐	
Spillway Channels	■	■	☐		☐	
Downstream Toe Area	■	■	☐		☐	
Encroachments	☐	☐	☐		☐	
Site Restoration	☐	☐	☐		☐	
E & S Plan on Site	☐	☐	☐		☐	
E & S Controls	☐	☐	☐		☐	
Left Abutment					☐	

Inspection Results Code:				
	☐ NOVIO (No significant violations noted)	☐ OUTST (Outstanding violations, notice req'd)	☐ RECUR (Recurring violations)	■ REPAR (Repairs or upgrade required)
	☐ VIOIC (Viols noted and immediately corrected	☐ VIOLS (Violation(s) noted)	☐ VOV (New and outstanding violations noted	☐ VRV (New and recurring violations noted)
	☐ DVN (deminimus violations noted)			

Violations Noted? ☐ Yes ☐ No Field Notice of Violation? ☐ Yes ☐ No Compliance Order? ☐ Yes ☐ No

Remarks: This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. The inspector's full report is available by contacting the DEP office noted above.

The modification of the right primary spillway is complete. The left abutment seepage continues to be a concern. Expansion of the left emergency spillway will start soon.

DEP Inspector was accompanied by		DEP Rep: Lawrence Busack	Date:
■ Owner	☐ Engineer for Owner or Permittee	(signature)	9/21/06
☐ Permittee	☐ Other	(print name) **Robert Kish, Sr Consultant** Phone: **412-974-0749 (cell)**	Time:

☐ White – Owner, Permittee, or Representative ☐ Yellow – Division of Dam Safety, Central Office ☐ Pink – DEP Regional File

■

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

DAM INSPECTION REPORT

Dam No.: D04-049
Dam Name: Little Blue Run
Inspected By: Lawrence Busack, SWRO
Date of Inspection: 9/21/06
Accompanied By: Robert Kish, senior consultant

LOCATION

Stream: Little Blue Run
Municipality: Greene Township
County: Beaver

Latitude: **40** ° **37** ' **39** " North
Longitude: **80** ° **30** ' **43** " West

USGS TOPO: East Liverpool, North OH-PA-WV **North:** 1.2 inches **West:** 2.4 inches

Directions:

Mile	Instruction	For	Toward
0.0	**Depart SR-68, Industry, PA 15052 on Ramp (West)**	**131 yds**	**PA-168 / Shippingport**
0.1	Merge onto SR-168 [Shippingport Bridge]	0.8 mi	
0.8	Turn LEFT (North) onto Shippingport Rd	0.2 mi	
1.0	Turn LEFT (West) onto Ferry Hill Rd	0.2 mi	
1.3	**At 212 Ferry Hill Rd, Shippingport, PA 15077, return South-East on Ferry Hill Rd**	**0.2 mi**	
1.5	Turn RIGHT (South) onto Shippingport Rd	0.2 mi	
1.7	Keep STRAIGHT onto SR-168	3.3 mi	
5.0	Keep STRAIGHT onto Pine St	0.2 mi	
5.1	Road name changes to Georgetown Rd	3.2 mi	
9.1	*Gate access required* Turn LEFT (West) onto Little Blue Hollow Rd	1.2 mi	
9.6	**Arrive D04-049**		

OWNER: Brian Warnaka
Site First Energy Generation Corp
Bruce Mansfield Plant
P.O. Box 128
Shippingport, PA 15077-0128
724-643-5000

Richard Sprecker, Environmental Supervisor
Contact: Robert Kish, Senior Consultant
724-682-6852 office
412-974-0749 (cell)
kishr@firstenergycorp.com

Alexander Decola – emergency drill
724-682-6845

Engineer: Philip Glogowski, PE
GAI Consultants, Inc.
385 East Waterfront Drive
Homestead, PA 15120-5005

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218
412-476-2000 ext 1414 Philip Glogowski,

PERTINENT DATA

Type: Rock fill with impervious soil care
Height: 400 feet
Storage: 73,000 acre-feet
D.A.: 2.93 sq. miles
Class: A-1

PRESENT CONDITIONS

Crest	This is a curvilinear dam with the vertex pointed upstream. The crest is 2100 feet long by 50 feet wide at elevation 1100 with a maximum elevation of 1102 at the center of the dam. It is topped with a crushed stone access road
Upstream Face	The upstream face is a uniform 2 to 1 slope faced with large rock riprap. The upstream face of the saddle dam appears uniform and has a grass and brush cover. Normal pool elevation is1088 and the dam is at elevation 1086.2 or 1.8 below normal pool. The water is about pH 11
Downstream Face	The downstream slope is a 2 to 1 slope faced with large rock riprap. In order to collect seepage from along the right abutment there is a perforated 6" perforated HDPE trench drain at elevation 1015 and an 8" perforated HDPE trench drain at elevation 930 that connect to a solid 8" HDPE collection pipe that goes down the right groin and discharges to a small channel just above the toe. There is also a 6" perforated HDPE trench drain at elevation 930 that discharges to a small collection weir on the right abutment adjacent to the road. On the left abutment, starting at about elevation 930, there is a large area of seepage approximately 400 feet long by 175' feet high that is covered with wetland vegetation and has several surficial slides in the shallow soil over the bedrock. The seepage probably comes from the impoundment at elevation 1088. The impounded water has a pH of approximately 11 and the right abutment seepage has a pH of about 8+
Outlet Structure	Same as primary spillway
Outlet Conduit	Same as primary spillway
Primary Spillway	The left spillway is a 36 diameter concrete pipe. There is a trash rack in front of it. The pipe invert is a 1090. The pipe discharges to the stilling basin at the toe of the dam. : The right spillway has an inlet with a trash rack controlled by a 3' wide stop log structure with the invert at 1083. A rock lined trapezoidal channel leads to the inlet. Between the inlet and the impoundment is a soil berm with two 24" plastic pipes 50 feet long to control the amount of ash getting into the spillway. Inside the inlet are valves to control the discharge.
Emergency Spillway	The emergency spillway is located along the left side of the dam (to the left of the primary spillway). It is located in original ground and is trapezoidal earth channel with a bottom width of 30 feet and 2 to 1 slopes. The invert is elevation 1095. Plans are to enlarge this spillway channel and install a labyrinth weir crest
Spillway Channels	The right primary spillway discharges into a 24" HDPE pipe that enters a DS box at elevation 1060 and then crosses the road at elevation 1000. It then follows along the road in an open channel leading to the stilling basin. The left primary spillway outlet drops in elevation 400' down a 36" concrete

	pipe before entering the stilling basin at the toe of the dam From the stilling basin the discharge is piped through a 24" Drisco pipe (supernatant bypass pipe). The bypass pipe goes through the railroad tunnel and discharges to a headwall with an energy dissipater that then flows to Mill Creek. The emergency spillway wasteway channel discharges over the hillside into a wooded area then by overland flow to the stilling basin..
Downstream Toe Area	The toe consists of a 6 foot thick filter blanket with a perforated PVC pipe. There is a stilling pond at the toe that collects all of the seeps and the outlet for the primary spillway.
Left Abutment	The left abutment is at a 1.8 to 1 slope. There are wetlands high on the abutment and there were 2 surface slides, 1 in December 2001 and 1 in August 2004. The water within the impoundment is at a pH of 11 and the pH exiting the abutment is probably at a pH of 8+ since the pH of the water on the right side is at a pH of 8+.
Encroachments	
Site Restoration	
E & S Plan on Site	
E & S Controls	

Action(s) on Previous Recommendations:

January 11, 2006

Bureau of Waterways Engineering

Brian Warnaka

Pennsylvania Power Company

Bruce Mansfield Plant

Re: DEP File No. D04-049

Receipt is acknowledged of the Dam Repair Completion Certification, as-built drawings, photographic documentation, and other information submitted by GAI Consultants for the modification of the secondary spillway outlet structure and the stilling basin weir and outlet channel, and the construction of a pipeline from the secondary spillway outlet structure to the stilling basin at the Little Blue Run Dam, located across Little Blue Run in Green Township, Beaver County. This work was authorized by our letter of June 30, 2005.

We have reviewed the submitted Completion Certification and other information. Based upon this information, all construction requirements of the Department's June 30, 2005, "Letter of Authorization" have been fulfilled. The Department considers construction activities at the dam completed.

Tyson R. Clouser.

December 28, 2005

Bureau of Waterways Engineering

Phillip E. Glogowski, P.E.

GAI Consultants

Re: Proposed Emergency Spillway Modification
Little Blue Run Dam
Pennsylvania Power Company
DEP File No. D04-049

We have completed a review of your submission to this office dated November 21, 2005, regarding the proposed spillway modifications at the Little Blue Run Dam. Your submission included a response letter to our comments on your report dated March 8, 2005, revised hydrology and hydraulic calculations, and construction plans and specifications. We have the following comments and recommendations regarding the proposed plans:

1. We concur that the proposed labyrinth spillway is adequate for the PMF design flow.

2. Construction of the spillway will require the excavation of a cut slope of 2 horizontal to 1 vertical on the downstream, western side of the spillway. Due to the steep slope proposed, please provide additional information on the slope stability based on the soil and/or rock materials. Also, please provide additional information on your plans to stabilize and maintain this slope following construction. Your specifications do not seem to include any special measures applicable to the steep slope.
3. On your plan drawings, including Drawing No. F030, you do not show sub-base material for the concrete work. Depending on ground water levels in your excavation, there may be a need to provide for subsurface drainage beneath the concrete apron of the spillway.
4. Based on the current normal pool level and the expected infrequency of spillway activation, the proposed structure will not need cutoff walls to minimize seepage from the impoundment. If it is possible that conditions will change in the future, such that the normal pool level is raised and the spillway is activated frequently, then we would recommend that seepage cutoff walls to be constructed behind the sidewalls and beneath the spillway apron. Please consider this possibility prior to finalizing your plans.
5. A specification for the waterstop is not included on the drawings or in Section 2 of the Technical Specifications. Generally, we recommend a 9-inch center bulb waterstop. We also require specifications on the "welding" of the joints between the pieces of waterstop. We recommend that three-way joints be pre-fabricated in a shop rather than being fabricated during on-site construction. Due to potential cracking and difficulties in construction, we do not recommend the split rib type of waterstop.
6. On Sections A and C on Drawing No. F030, the waterstop located between the concrete wall and base concrete will conflict with the reinforcing bar in the base. This is also the case for Detail 1/F030. The waterstop must not be cut for the rebar, and this conflict must be resolved. One possibility is to utilize a raised key rather than a recessed key. It may also be possible to adjust the level of the steel reinforcement and/or utilize a smaller size of waterstop.
7. We have reviewed the details of your retaining wall design as shown on Section C/F030. For our review, we've compared your reinforcement bar plans with tables in the Concrete Reinforcement Steel Institute Handbook (1992). Based on this comparison, we believe the size of the #5 dowels in your design is inadequate for the load on the retaining wall, particularly for the western side of the spillway where there will be a steep slope behind the wall. Therefore, we request that you submit engineering calculations for our review. Otherwise, you may choose to refer to the CRSI Handbook and utilize their recommendations.
8. Also on Drawing No. F030, the number of concrete joints is insufficient. For all concrete construction of both the walls and the base, we recommend contraction joints at a minimum spacing of 30 feet. We also recommend expansion joints at a minimum spacing of 90 feet, and therefore at least one expansion joint is recommended for the 185 ft. width of the spillway slab. Reinforcement bar should not be extended through these joints; rather smooth dowels and/or bondbreakers are required. Expansion joints should have end caps and dowel type and spacing need to be specified. Note that concrete keys are not recommended for these expansion and contraction joints. Also, downstream apexes on the labyrinth weir should receive additional reinforcement. Perhaps the doweled joints should be moved to align with the upstream apexes instead of the downstream apexes.

Please address each of the above comments and provide revised plans. Three properly sealed sets of the final construction drawings and specifications should be submitted to this office for review and approval. A Professional Engineer's seal with the engineer's original signature must be placed on the first page of all design documents plans and specifications. All subsequent pages of plans must also be sealed. Upon approval of the final plans and specifications, we will authorize the work by Letter of Authorization. If you have any questions relative to the above comments, please contact Ron Mease at 717-772-5948. Thank you for your cooperation in this matter.

Roger P. Adams, P.E.

October 25, 2005
Bureau of Waterways Engineering
Mr. Philip E. Glogowski, P.E.

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

GAI Consultants, Inc.

Re: DEP File No. D04-049

We thank you for your October 14, 2005 correspondence summarizing Little Blue Run Dam discussions from a September 13th meeting here in Harrisburg. Your effort to arrange the meeting with our staff, GAI's Stanley Michalski and Richard Sprecker of First Energy is appreciated. We discussed the proposed emergency spillway modifications and my questions from a review of the latest GAI inspection reports, Nos. 81 and 82. These reports presented observations and instrumentation data taken between the periods of April and September 2004, and October 2004 and March 2005.

Your meeting presentation and follow-up response letter display GAI's depth of understanding of the dam and its foundation. Indeed, the inspection reports that GAI submits for the dam are always of high quality and represent a significant effort. The presentation of instrumentation data that has been collected since the dam was completed in 1977 is particularly well done.

With that said, however, we still have some concern with the seepage on the left abutment. As stated during our meeting, the left abutment is steep, with a slope of about 1.8H:1V, and has had two episodes of slope movements, one in December 2001 and one in August 2004. Instrumentation data that you emphasized should minimize our concern is the flow rates measured with the upper left abutment weir. Your graphical interpretation of the data shows that the flow may be decreasing after a peak of 322 gpm in February 2004. This data alone does not reduce our concern. Weir flow data collected over the next year will be required to substantiate this interpretation. We would encourage that the lower left abutment weir be repaired so that the flow data collected from this weir can also be used to establish any trends.

The Division of Dam Safety does see the need to visit the site, possibly in the spring of 2006, to gain a better understanding of the conditions at the left abutment. You have already led a group of Dam Safety staff members down the left abutment in March 2004, but we would appreciate a second look. Among the items of interest will be the contact of the dam to the abutment, areas of the previous slides and how they correspond to the springs and the coal seams, and the weirs. Also, at that time an additional block of instrumentation data will probably have been collected and could be discussed. If you have any questions, please contact me at 717-772-5958 or wfranz@state.pa.us .

William Franz, P.E.

-----Original Message-----
From: Franz, William
Sent: Thursday, August 18, 2005 3:13 PM
To: Kriley, Christopher
Subject: Little Blue Run- Left abutment concerns

Chris,

I am reviewing the last two inspection reports submitted by GAI for Little Blue. I know you have been at the site numerous times. I have looked over the last two SW inspection reports that you submitted.

I have only been at the site two times - March and Sept 2004. The March visit included a walk led by Phil Glogowski down the left abutment. I just do not like the amount of seepage coming out of the hillside. The biologist that we had along with us, Vince Humenay, said that it was the steepest wetlands that he had ever seen. The seepage exits too high on the slope. The mudslides that occurred in December 2001 and August 2004 are worrisome to me. I am not convinced that the two weirs at the base of the abutment are collecting all of the seepage. I see that the lower weir has a visible leak.

I plan on calling you late this week or early next week.

Bill Franz

Comments: The modification of the right primary spillway is complete. The left abutment seepage continues to be a concern. Expansion of the left emergency spillway will start soon.

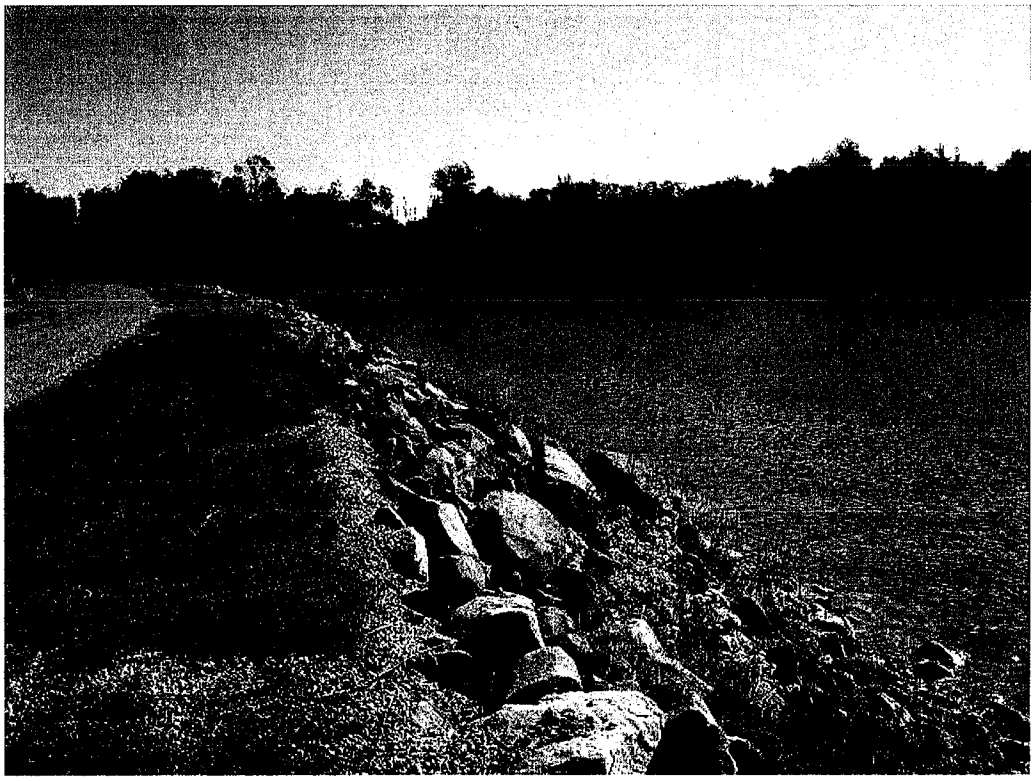
Submitted by: Lawrence Busack, SWRO

This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions

Lawrence Busack
9/21/06

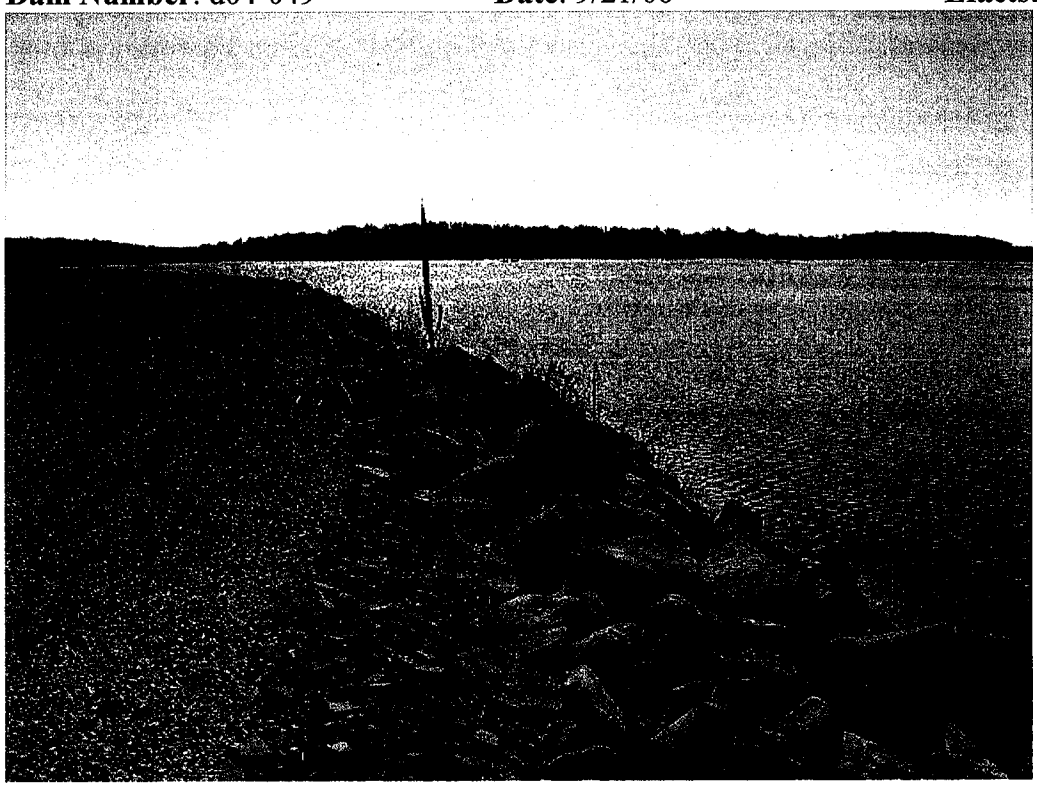
Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 US & crest from right

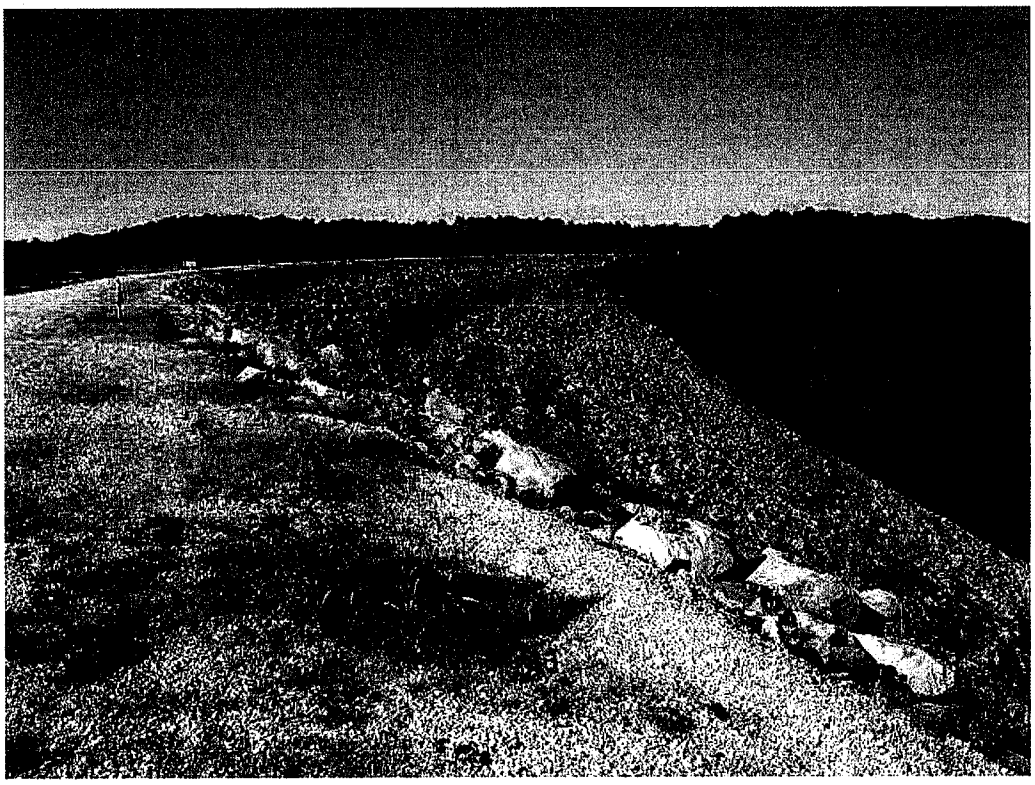


d04-049 9/21/06 US from center looking right

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

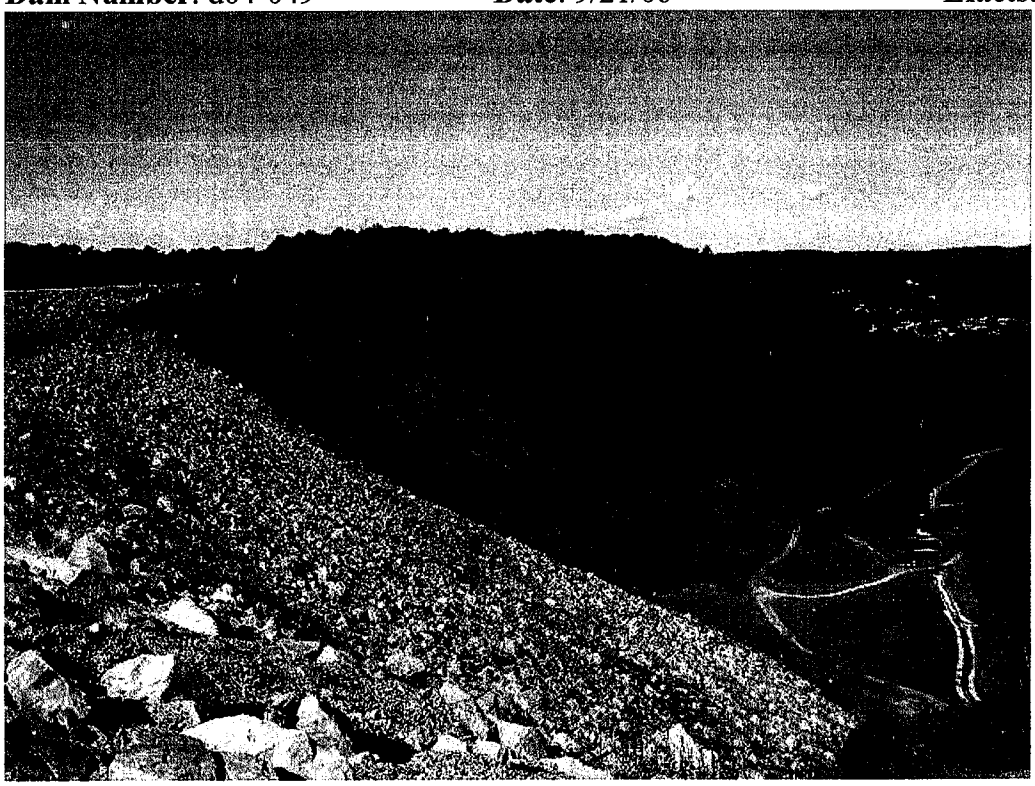


d04-049 9/21/06 US from left



d04-049 9/21/06 DS from right

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

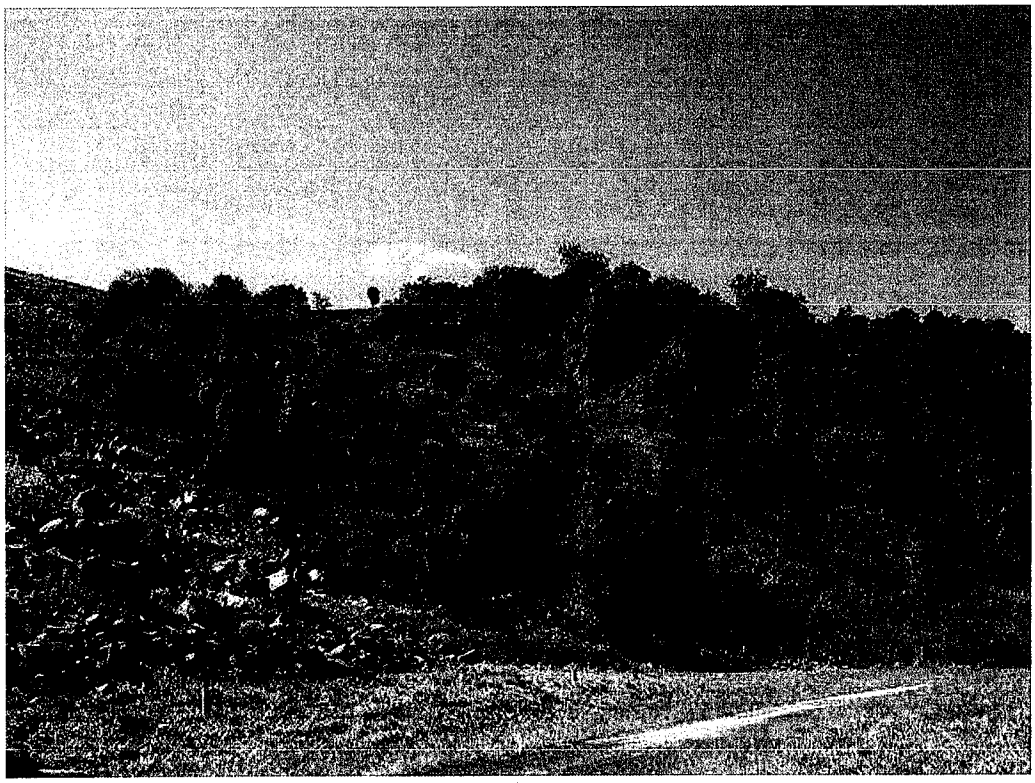


d04-049 9/21/06 DS & left abutment from right crest

d04-049 9/21/06 left abutment from center crest

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 toe from center



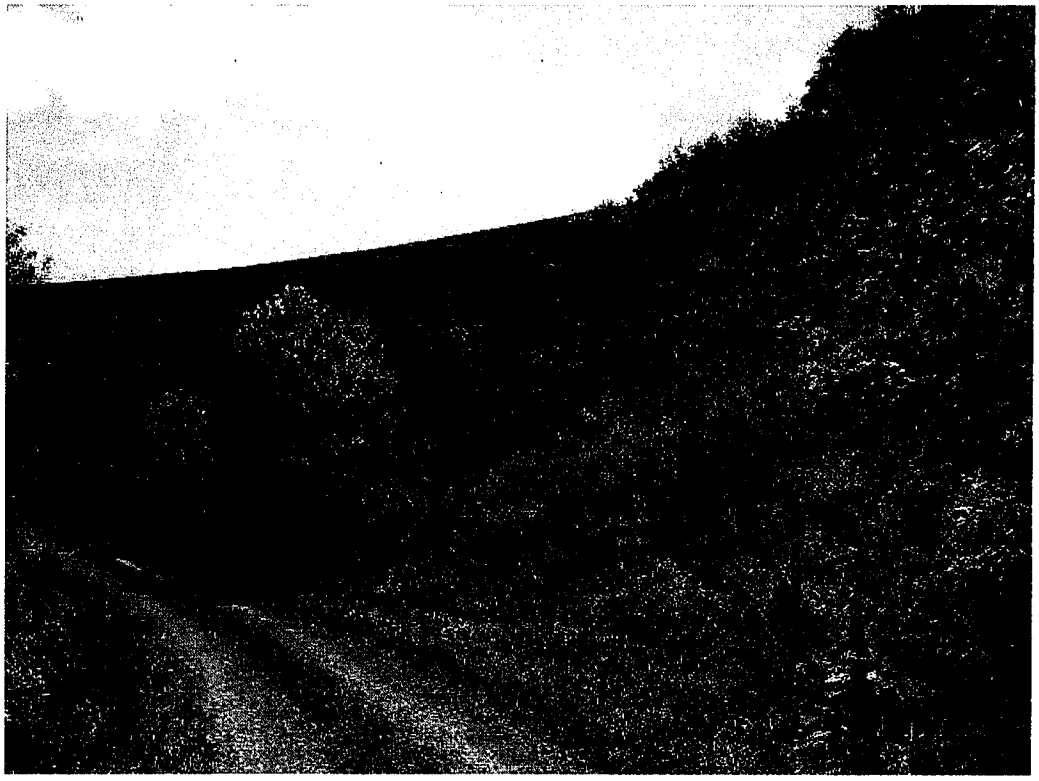
d04-049 9/21/06 left abutment from toe

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 left abutment

d04-049 9/21/06 left abutment from toe

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218



d04-049 9/21/06 lower end of left abutment looking toward dam

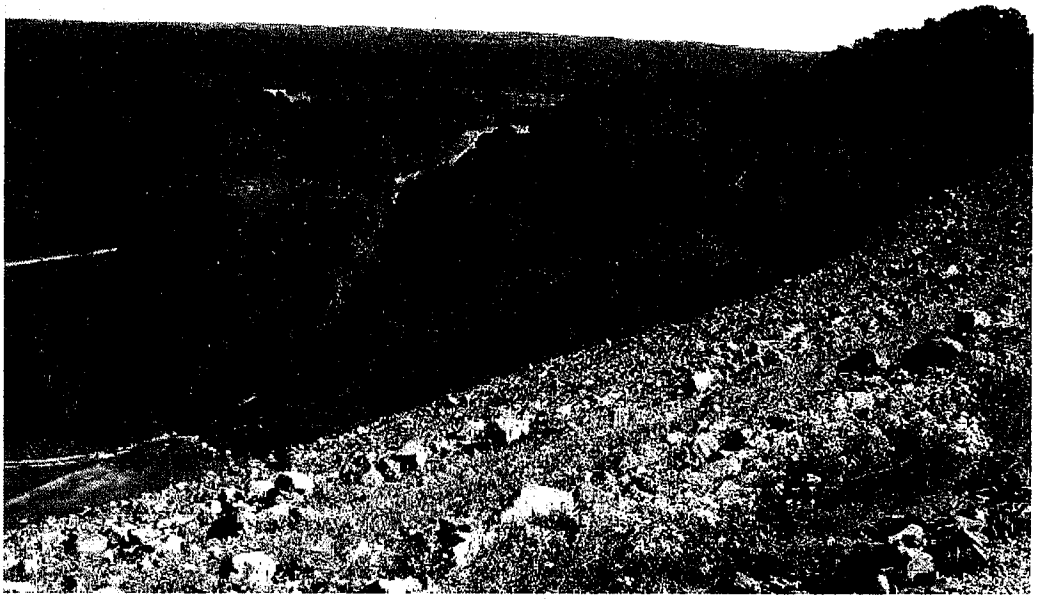
d04-049 9/21/06 DS slope from left

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 right abutment from center

d04-049 9/21/06 right abutment from center

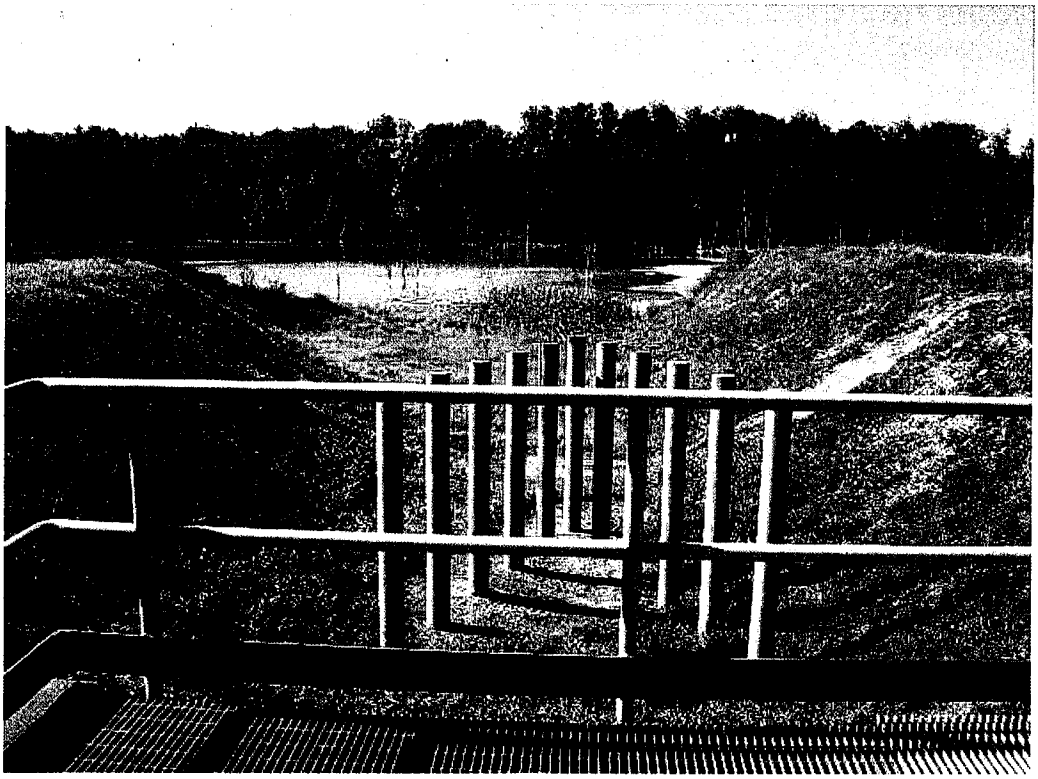
Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218



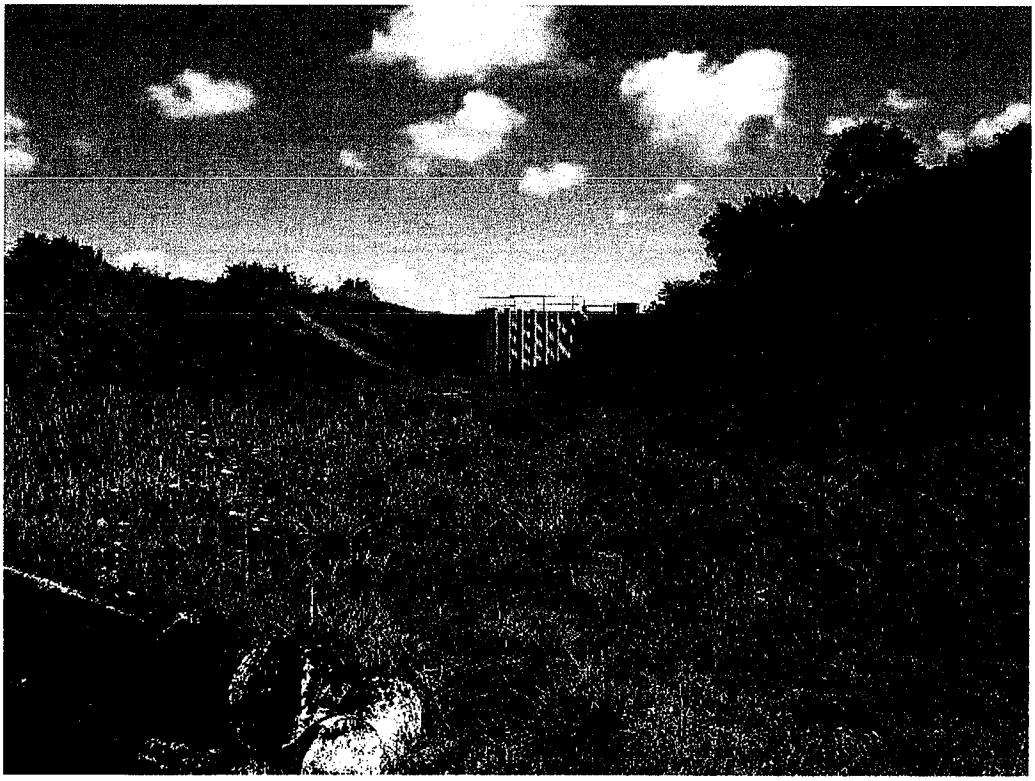
d04-049 9/21/06 right abutment

d04-049 9/21/06 right abutment from toe

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218



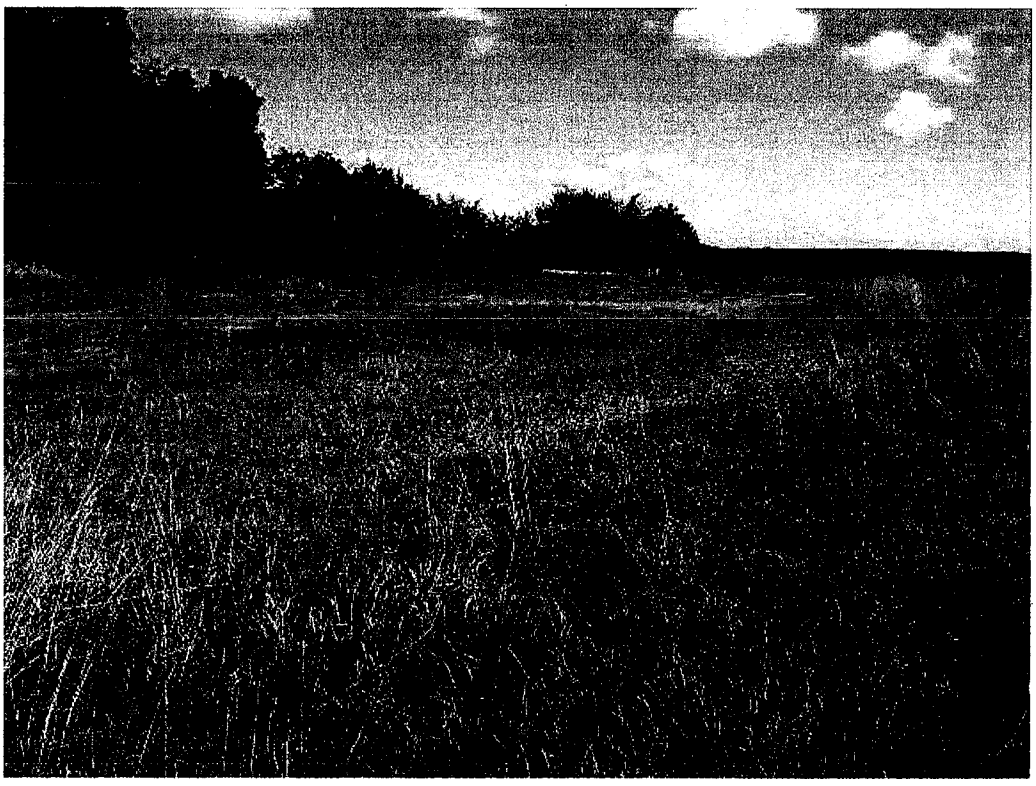
d04-049 9/21/06 left primary spillway looking toward approach



d04-049 9/21/06 looking toward left primary spillway from approach

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 outlet of left primary spillway



d04-049 9/21/06 area between left primary spillway and emergency spillway

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 approach to emergency spillway

d04-049 9/21/06 emergency spillway looking DS

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 approach to right primary spillway

d04-049 9/21/06 approach to right primary spillway

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 right primary spillway intake

d04-049 9/21/06 right primary spillway outlet

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

d04-049 9/21/06 right primary spillway wasteway

04-049 9/21/06 right primary spillway wasteway

Dam Number: d04-049 **Date**: 9/21/06 **Efacts:** 1567218

04-049 9/21/06 right primary spillway wasteway

04-049 9/21/06 right primary spillway wasteway

3140-FM-W E0001 6/2005

DEP DATA RECORDS	Inspection # 1475939
Complaint #	Enforcement #
Dam # D04-049	Date 8/29/05 DW

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING
DIVISION OF DAM SAFETY

DAM SAFETY INSPECTION NOTICE

DEP Office Address	Southwest Regional Office Phone 412-442-4315 400 Waterfront Drive Pittsburgh, PA 15222-4745	Dam Permit or I.D. # **d04-049** Dam or Project Name **Little Blue Run** County **Beaver**
Owner or Permittee	**First Energy Generation Corp** **Bruce Mansfield Plant**	Municipality **Greene Township** Stream **Little Blue Run**
Complete Mailing Address	**128 Ferry Hill Road** **PO Box 128** **Shippingport, PA 15077-0128**	Take GPS readings at the center of the crest of the dam. Latitude: **40 ° 37 ' 39 "** North Longitude: **80 ° 30 ' 43 "** West

Type of Inspection: ☐ ADMIN – Administrative/File Review ☐ CONST – Construction Progress ☐ FLWUP – Follow up
☐ CEI – Compliance Evaluation ■ DAM12 – Category 1 or 2 dam ☐ INCDT – Incident response
☐ COMPL – Complaint inspection ☐ DAM3 – Category 3 dam ☐ OTHER_____

Location/ Appurtenance	Insp.	Condition OK	Condition Concern	Comment/Explain Concern	Violation Check if yes	Cite 25 Pa. Code
Crest	■	■	☐		☐	
Upstream Face	■	■	☐		☐	
Downstream Face	■	☐	■	**Seepage on left DS abutment**	☐	
Outlet Structure	☐	☐	☐	**Same as primary spillway**	☐	
Outlet Conduit	☐	☐	☐	**Same as primary spillway**	☐	
Primary Spillway	■	■	☐		☐	
Emergency Spillway	■	■	☐		☐	
Spillway Channels	■	■	☐		☐	
Downstream Toe Area	■	■	☐		☐	
Encroachments	☐	☐	☐		☐	
Site Restoration	☐	☐	☐		☐	
E & S Plan on Site	☐	☐	☐		☐	
E & S Controls	☐	☐	☐		☐	
					☐	

Inspection Results Code:				
	■ NOVIO (No significant violations noted)	☐ OUTST (Outstanding violations, notice req'd)	☐ RECUR (Recurring violations)	☐ REPAR (Repairs or upgrade required)
	☐ VIOIC (Viols noted and immediately corrected	☐ VIOLS (Violation(s) noted)	☐ VOV (New and outstanding violations noted	☐ VRV (New and recurring violations noted)
	☐ DVN (deminimus violations noted)			

Violations Noted? ☐ Yes ■ No Field Notice of Violation? ☐ Yes ☐ No Compliance Order? ☐ Yes ☐ No

Remarks: This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions. The inspector's full report is available by contacting the DEP office noted above.

The modification of the right primary spillway was underway. The left abutment seepage continues to be a concern.

DEP Inspector was accompanied by		DEP Rep: Lawrence Busack (signature)	Date: 8/29/05
☐ Owner	☐ Engineer for Owner or Permittee		
☐ Permittee	☐ Other	(print name) **Joe Smith** Phone: **724-544-2981 (Cell)**	Time:

☐ White – Owner, Permittee, or Representative ☐ Yellow – Division of Dam Safety, Central Office ☐ Pink – DEP Regional File

■

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

Crest	This is a curvilinear dam with the vertex pointed upstream. The crest is 2100 feet long by 50 feet wide at elevation 1100 with a maximum elevation of 1102 at the center of the dam. It is topped with crushed stone access road
Upstream Face	The upstream face is a uniform 2 to 1 slope faced with large rock riprap. The rock appears in good shape. The upstream face of the saddle dam appears uniform and has a grass and brush cover. The dam is maintained at elevation 1088.
Downstream Face	The downstream slope is a 2 to 1 slope faced with large rock riprap. In order to collect seepage from along the right abutment there is a perforated 6" perforated HDPE trench drain at elevation 1015 and an 8" perforated HDPE trench drain at elevation 930 that connect to a solid 8" HDPE collection pipe that goes down the right groin and discharges to a small channel just above the toe. There is also a 6" perforated HDPE trench drain at elevation 930 that discharges to a small collection weir on the right abutment adjacent to the road. On the left abutment, starting at about elevation 930, there is a large area of seepage approximately 400 feet long by 175' feet high that is covered with wetland vegetation and has several surficial slides in the shallow soil over the bedrock. The seepage probably comes from the impoundment at elevation 1088. The impounded water has a pH of approximately 11.
Outlet Structure	Same as primary spillway
Outlet Conduit	Same as primary spillway
Primary Spillway	The left spillway is a 36 diameter concrete pipe. There is a trash rack in front of it. The pipe invert is a 1090. The pipe discharges to the stilling basin at the toe of the dam. : The right spillway has an inlet with a trash rack controlled by a 3' wide stop log structure with the invert at 1083. There is a rock lined trapezoidal channel that leads to the new inlet. Between the inlet and the impoundment is a soil berm with two 24" plastic pipes 50 feet long to control the amount of ash getting into the spillway. They have also placed a floating break wall in the lake. Inside the inlet are valves to control the discharge.
Emergency Spillway	The emergency spillway is located along the left side of the dam (to the left of the primary spillway). It is located in original ground and is trapezoidal earth channel with a bottom width of 30 feet and 2 to 1 slopes. The invert is elevation 1095.
Spillway Channels	The left primary spillway outlet drops in elevation 400' down a 36" concrete pipe before entering the stilling basin at the toe of the dam. The right primary spillway discharges into a 24" HDPE pipe that enters a DS box at elevation 1060 and then crosses the road at elevation 1000 and then follows along the road for a distance of 2400' before entering an open channel leading to the stilling basin. The emergency spillway wasteway channel discharges over the hillside into a wooded area then by overland flow to the stilling basin.. From the stilling basin the discharge is piped through a 24" Drisco pipe (supernatant bypass pipe). The bypass pipe goes through the railroad tunnel and discharges to a headwall with an energy dissipater that then flows to Mill Creek.
Downstream Toe Area	The toe consists of a 6 foot thick filter blanket with a perforated PVC pipe. There is a stilling pond at the toe that collects all of the seeps and the outlet for the primary spillway.
Encroachments	
Site Restoration	

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

DAM INSPECTION REPORT

Dam No.: D04-049
Dam Name: Little Blue Run
Inspected By: Lawrence Busack, SWRO
Date of Inspection: 9/3/04
Accompanied By: Joe Smith

LOCATION

Stream: Little Blue Run
Municipality: Greene Township
County: Beaver
Latitude: 40-37-39 **Longitude:** 80-30-43 **GPS Verified** Y ☒ **(2004) or** N ☐
USGS TOPO: East Liverpool, North OH-PA-WV **North:** 1.2 inches **West:** 2.4 inches

Directions: 60 North to 68 East to 168 South. Go to Bruce Mansfield Plant (on left) go to the main entrance to guard house and ask for Joe Smith (724-643-2363) and he will take you to dam.

OWNER: Brian Warnaka
Site First Energy Generation Corp
Bruce Mansfield Plant
128 Ferry Hill Road
PO Box 128
Shippingport, PA 15077-0128
Contact: Joe Smith - environmental
724-643-2363
724-544-2981 (Cell)

Robert Kish, Senior Consultant
724-682-6852
412-974-0749 (cell)
kishr@firstenergycorp.com

Engineer: Philip Glogowski, PE
N Catherine Bazan-Arias, PhD, PE
GAI
385 East Waterfront Drive
Homestead, PA 15120-5005
412-476-2000 ext 1414 Philip Glogowski,
412-476-2000 ext 1431 N Catherine Bazan-Arias
n.bazan-arias@gaiconsultants.com

PERTINENT DATA

Type: Rock fill with impervious soil care
Height: 400 feet
Storage: 73,000 acre-feet
D.A.: 2.93 sq. miles
Class: A-1

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

PRESENT CONDITIONS

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Spillway Channels	The left primary spillway outlet drops in elevation 400' down a 36" concrete pipe before entering the stilling basin at the toe of the dam. The right primary spillway discharges into a 24" HDPE pipe that enters a DS box at elevation 1060 and then crosses the road at elevation 1000 and then follows along the road for a distance of 2400' before entering an open channel leading to the stilling basin. The emergency spillway wasteway channel discharges over the hillside into a wooded area then by overland flow to the stilling basin.. From the stilling basin the discharge is piped through a 24" Drisco pipe (supernatant bypass pipe). The bypass pipe goes through the railroad tunnel and discharges to a headwall with an energy dissipater that then flows to Mill Creek.
Downstream Toe Area	The toe consists of a 6 foot thick filter blanket with a perforated PVC pipe. There is a stilling pond at the toe that collects all of the seeps and the outlet for the primary spillway.

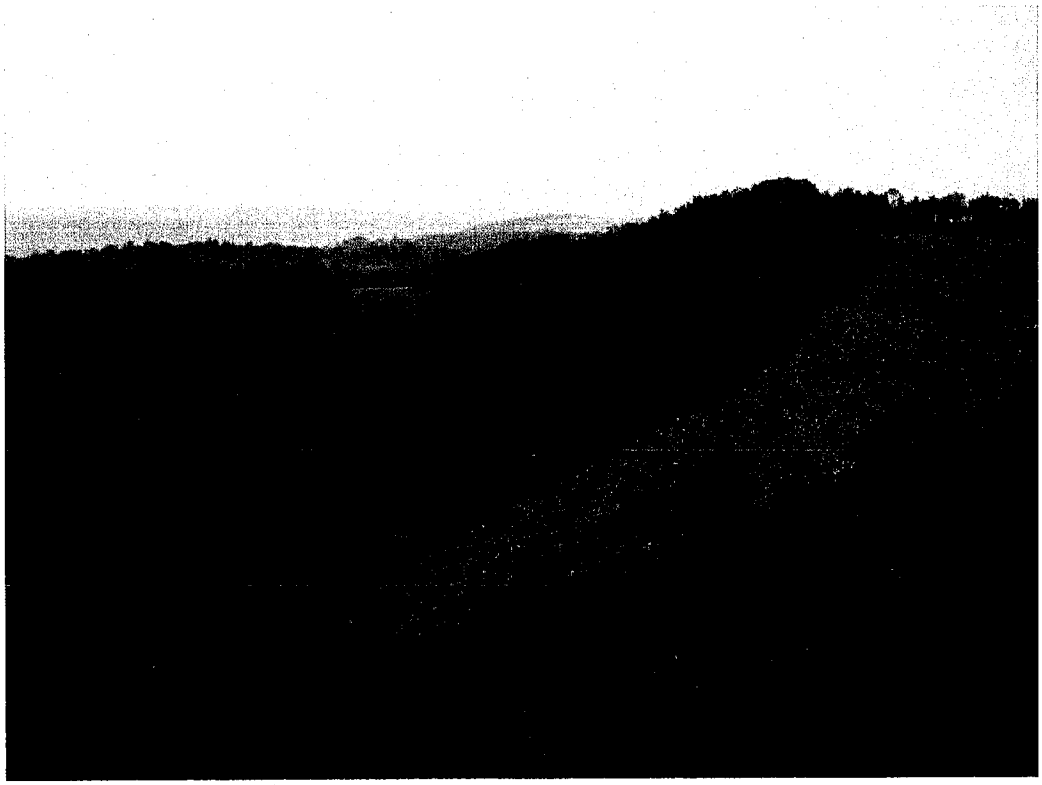
Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

Action(s) on Previous Recommendations:
On 6/30/ 05 Dam Safety approved the modification of the right primary spillway outlet box structure, constructing a 24" pipeline from the spillway to the stilling basin, modifying the stilling basin weir & outlet channel, and removing the existing 24" and installing the new 36" discharge pipe to the Ohio River.

Comments: The modification of the right primary spillway was underway. The left abutment seepage continues to be a concern.

Submitted by: Lawrence Busack, SWRO
This report is a summary of the undersigned DEP representative's brief visual inspection only on this date, not an in-depth investigation of the dam's present condition or compliance history. The condition of the dam can change rapidly, particularly with changes in reservoir level and changes in weather conditions

Lawrence Busack 2/27/06



d04-049 8/29/05 DS slope & right abutment

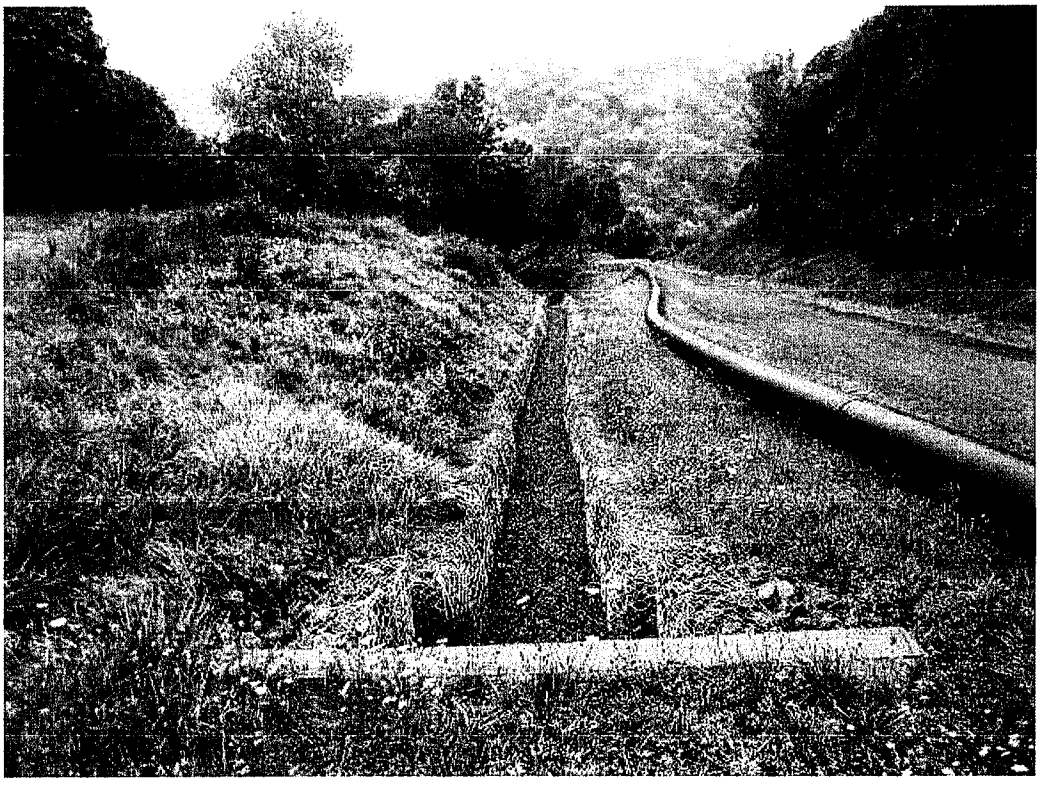
Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 DS slope & right groin

d04-049 8/29/05 seep at el 930 on right abutment

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 discharge of seepage from right abutment



d04-049 8/29/05 gabion channel for right abutment seepage

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 DS slpe & left abutment

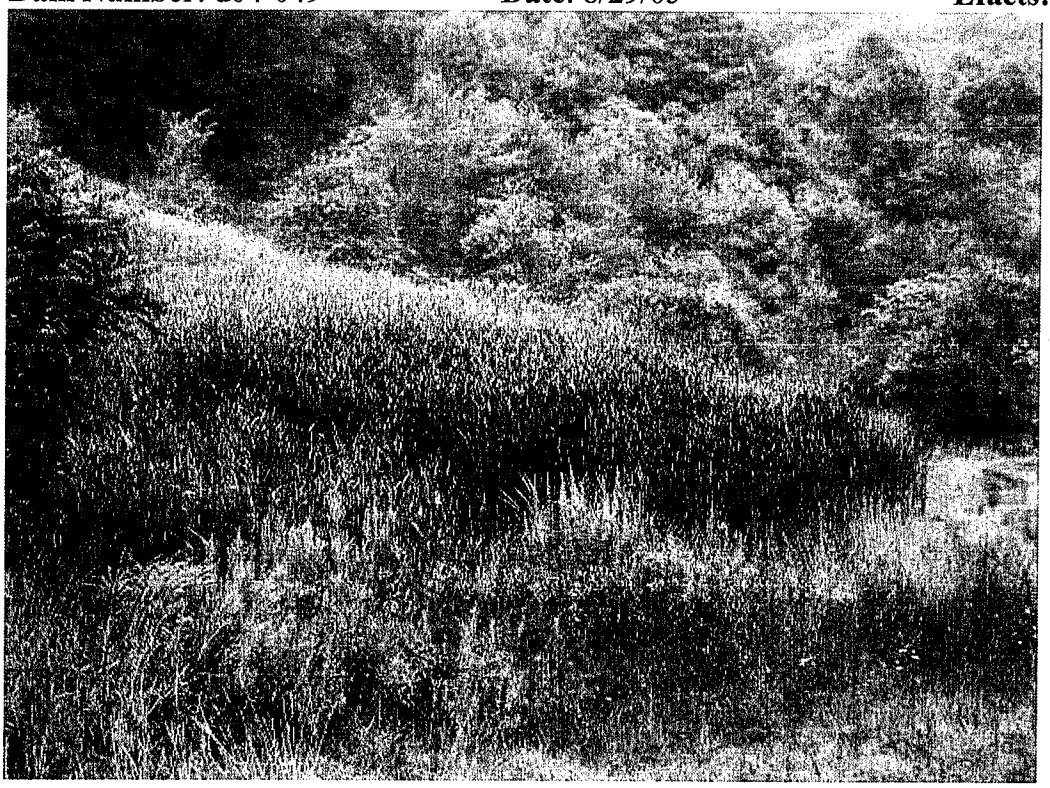
d04-049 8/29/05 left abutment from crest

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 left abutment

d04-049 8/29/05 wetland growth on left abutment

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

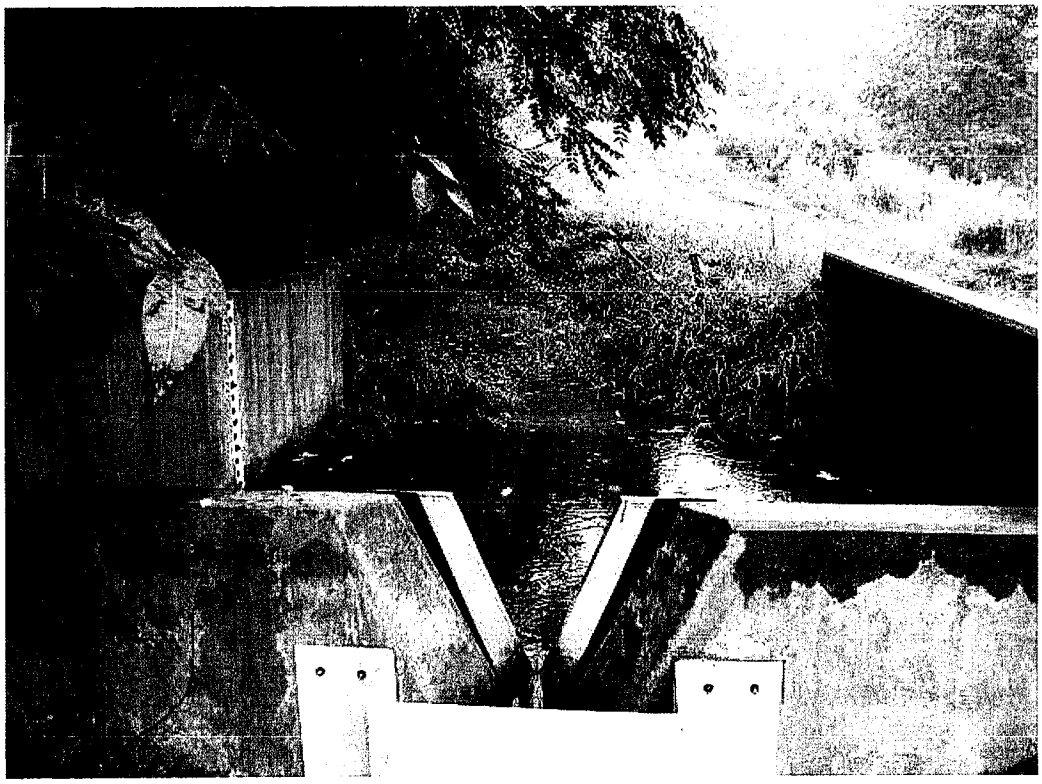


d04-049 8/29/05 wetland growth on left abutment

d04-049 8/29/05 wetland growth & discharge on left abutment

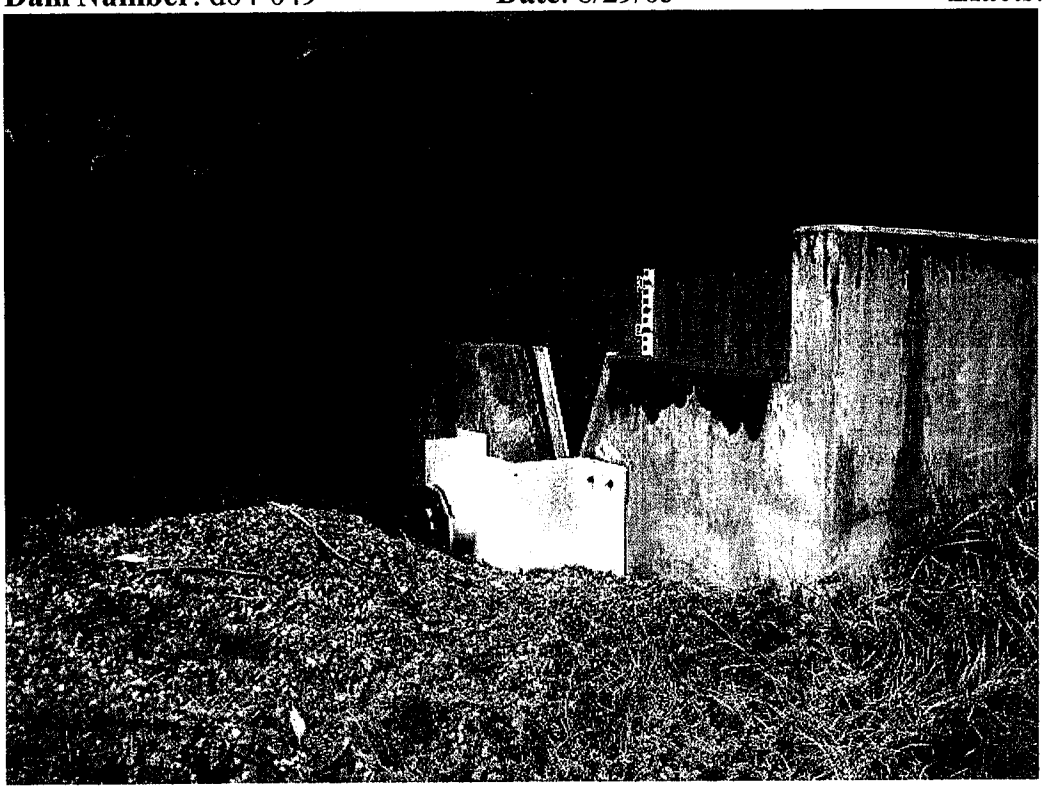
Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 close-up of left abutment discharge



d04-049 8/29/05 weir to measure left abutment flow

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

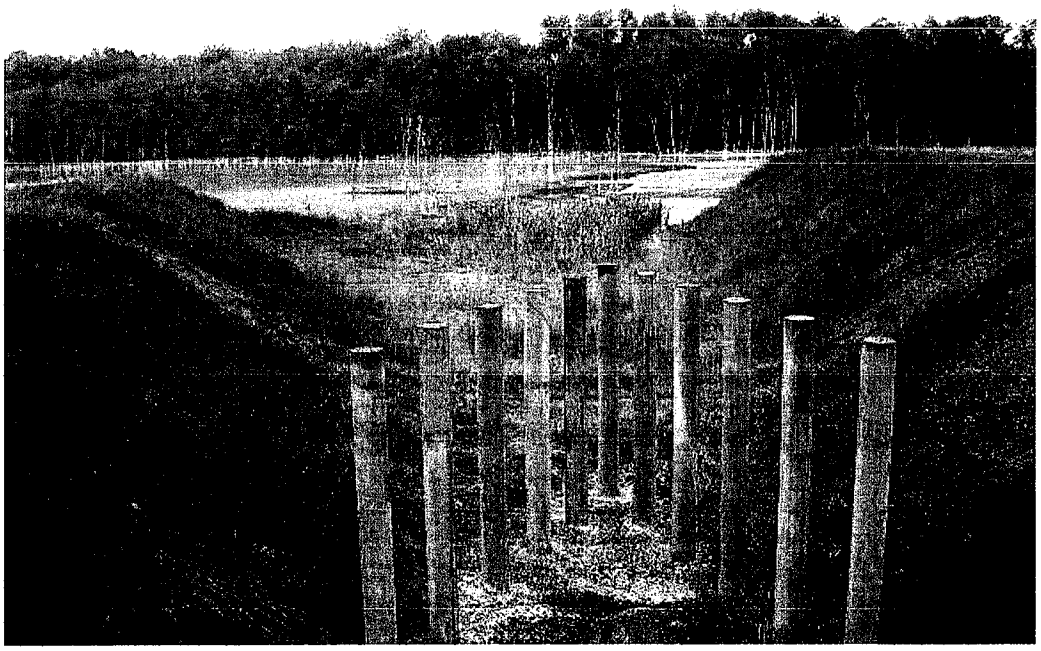


d04-049 8/29/05 weir to measure left abutment flow

d04-049 8/29/05 left side of impoundment

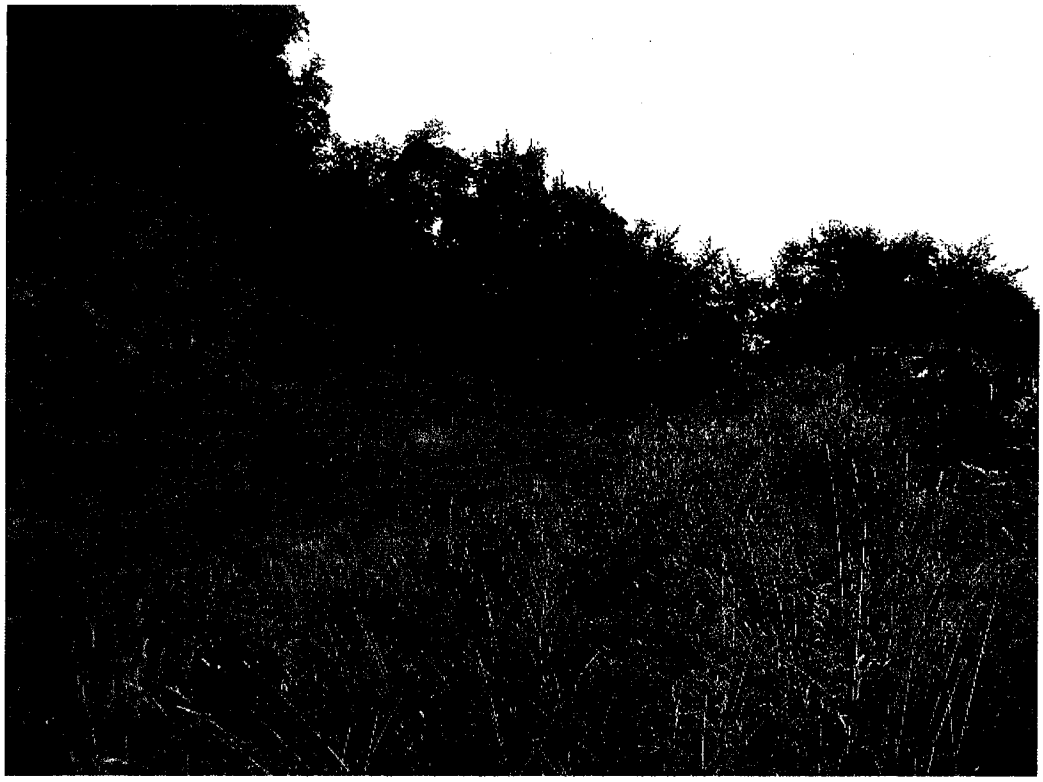
Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 approach to left primary spillway

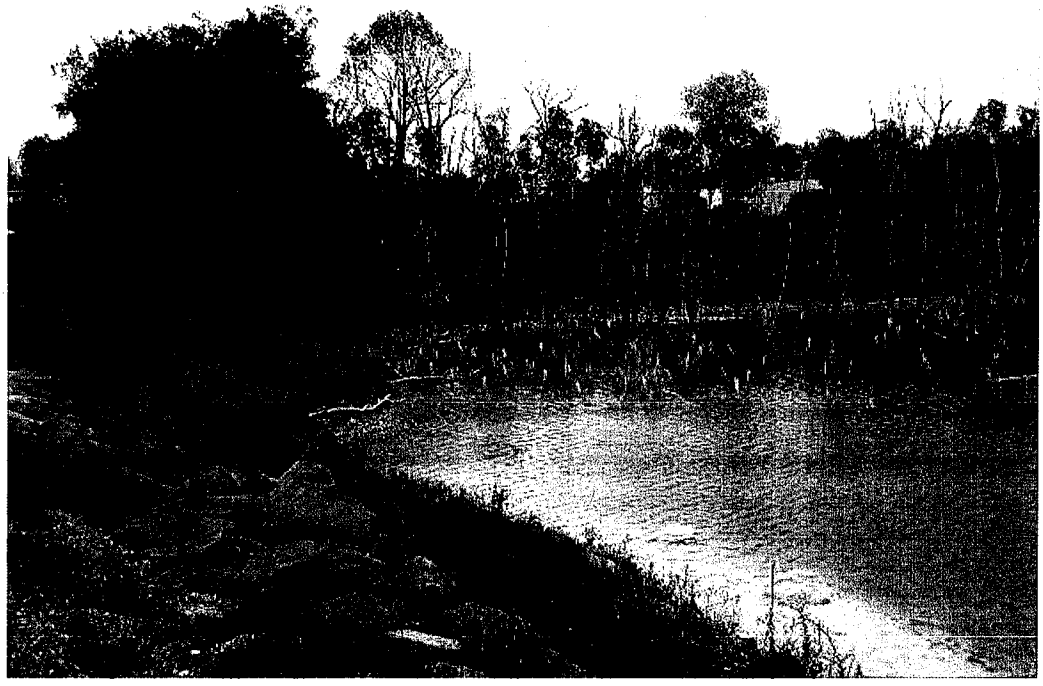


d04-049 8/29/05 looking from left primary spillway toward impoundment

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

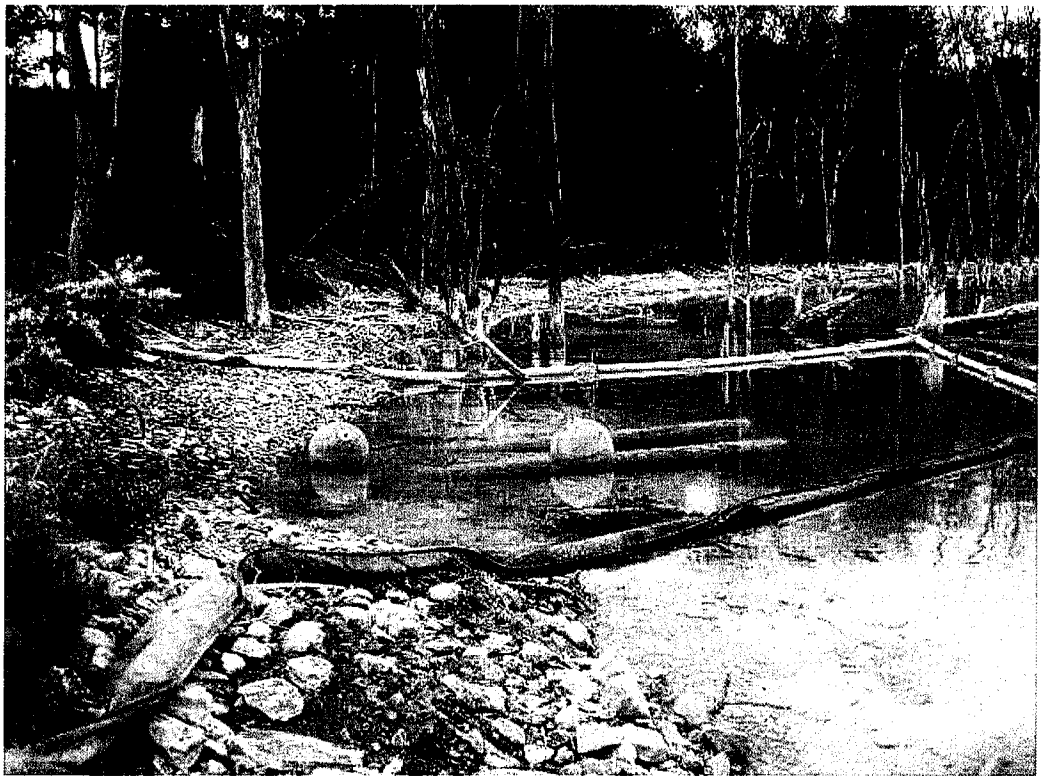


d04-049 8/29/05 emergency spillway as it flows over left abutment

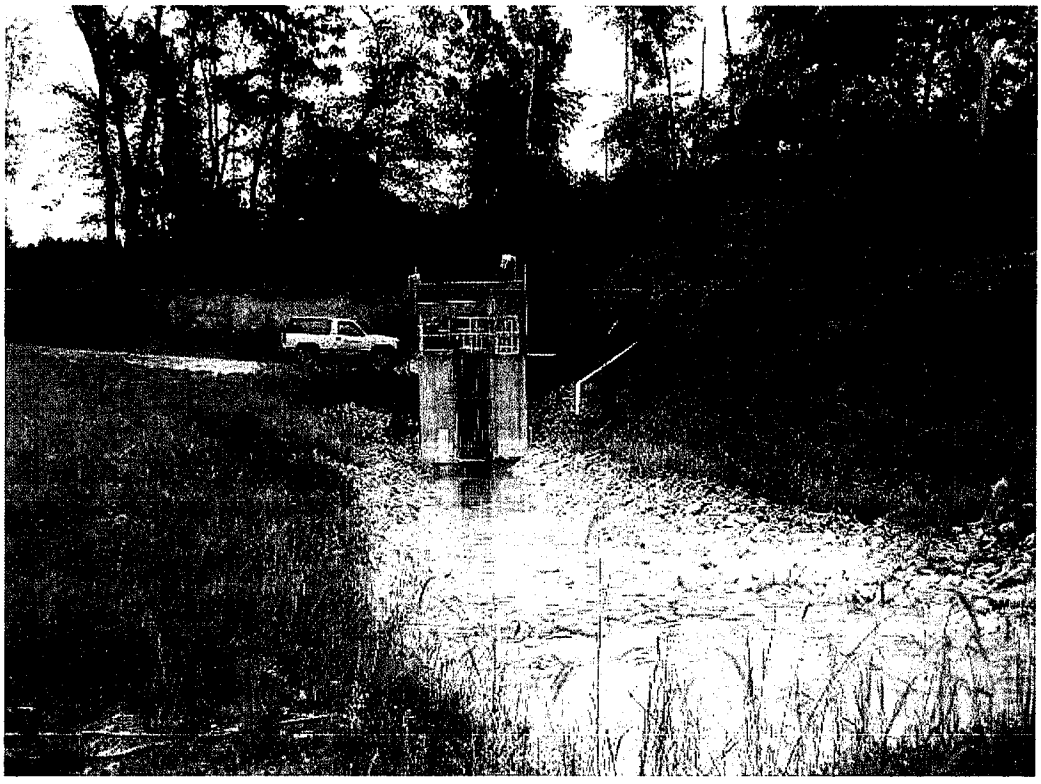


d04-049 8/29/05 right side of impoundment

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939



d04-049 8/29/05 approach to right primary spillway



d04-049 8/29/05 right primary spillway

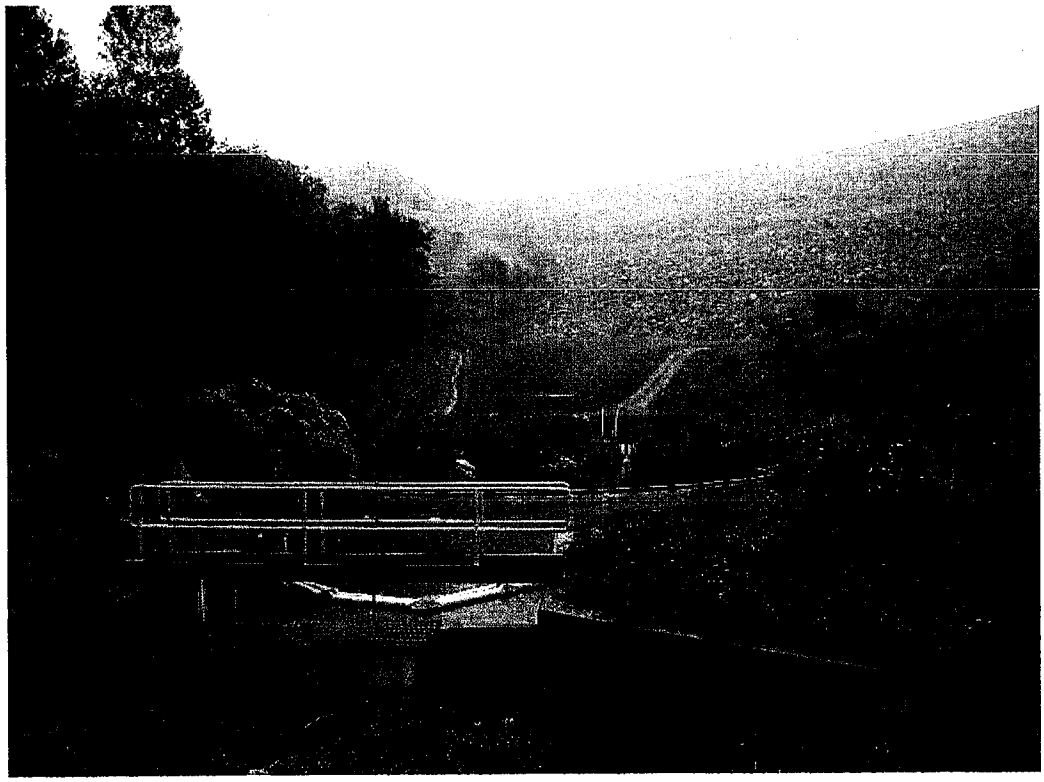
Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 24" HPDE pipe from outlet box at elevation 1000

d04-049 8/29/05 24" HPDE discharge pipe from right primary spillway

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 soil cut on right side of abutment



d04-049 8/29/05 stilling basin looking back toward dam

Dam Number: d04-049 **Date**: 8/29/05 **Efacts:** 1475939

d04-049 8/29/05 discharge channel from stilling basin